



market decisions
CORPORATION

Mode Shift Study Findings

*Part of the Washington State Transportation
Commission 2010 Ferry Research Initiative*



Washington State
Transportation Commission

Conducted by
Market Decisions Corporation
October 2010



Preface

- ❖ In 2010, the Washington State Transportation Commission (WSTC) changed the process of how research is conducted regarding Washington State Ferries (WSF). In the past, stand-alone research projects were executed, but some of the issues facing ferry operations are of a longitudinal nature (changes over time). The decision was therefore made to create the Ferry Riders' Opinion Group (FROG). FROG is an online community where ferry travelers will have an ongoing opportunity to weigh in on ferry issues through surveys and quick polls (single questions).
- ❖ The research initiative in 2010 consists of the following main phases:
 - Spring Customer Survey
 - Mode Shift and Elasticity of Demand Research
 - Freight Survey
 - General Market Assessment Survey
 - Summer Customer Survey
 - Capital Funding
 - Fare Strategies
- ❖ The focus of this report is the Mode Shift and Elasticity of Demand study.
 - A comprehensive report of all phases will be available January 2011.
 - Breakouts of all survey data by Legislative District will be available.
- ❖ All research was conducted by Market Decisions Corporation with input from the WSTC Research Team. For questions about this research, please contact Reema Griffith at WSTC ☎ (360) 705-7070.



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Please [click here](#) for access to the full data cross tabulations for this study.



Methodology

- ❖ This study is representative only of **PEAK VEHICLE DRIVERS** on Central and South Sound Routes and is not projectable to all ferry riders.
 - Peak vehicle drivers are also segmented into either discretionary and non-discretionary travel by their trip purpose.
- ❖ The following presents the findings for the 2010 Mode Shift Survey. The main objective of this research is to understand the future travel behavior of ferry rider's who drive a vehicle on during peak hours, and their preference for, and projected reaction to, potential changes that may be implemented by the Washington State Transportation Commission and Washington State Ferries to shift the drive-on vehicle load from on to off-peak or to walk-on traffic.
 - The survey was conducted between October 11, 2010 and October 20, 2010.
- ❖ Ferry riders who are members of FROG (Ferry Riders' Opinion Group) were sent an invitation to take the online mode shift survey but only those FROG members who drive a vehicle on during peak hours in the last 3 months in Central and South Sound routes were allowed to complete the study.
 - Peak hours were defined by Washington State Ferries on a route-by-route basis. Peak hours are shown in [Appendix C](#).
 - Given the uniqueness of the San Juan routes, they were not included in this study for several reasons: 1) Limited off-peak SJ sailings, 2) Limited volume of non-discretionary (commuter) SJ vehicle travel, and 3) Greater potential for mode shifting found in Central and South Sound routes.
- ❖ A total of 1,317 completed surveys were received, resulting in a maximum sampling variability of +/-2.70% at the 95% confidence level.
 - Statistical differences noted in the report are at the 95% confidence level or higher.
- ❖ The data is statistically representative of those riders who in the last 3 months drove on during peak travel times and was weighted by route in order to make the survey results proportionate to overall peak vehicle ferry ridership.
 - Information regarding specific weighting methods can be found in [Appendix B](#).



Methodology (Choice-Based Conjoint Overview)

- ❖ The key question addressed by this mode shift research is how do ferry riders **trade-off boarding mode, time of sailing, and price**. To answer that question, a choice-based conjoint exercise was utilized and a market simulator developed to forecast rider behaviors.
 - A simulator based on choice-based conjoint analysis is a statistical technique used in market research to *determine how people value different features that make up an individual product or service*.
- ❖ The choice-based conjoint exercise employed to build the simulator included the following variables:
 - Ferry fares - Different levels (ranging from +25% to -20%) from current fares for driving on during peak (congested periods), driving on before/after peak, and walking on during peak;
 - Wait time before boarding for on-peak drive-on trips, with levels of the same as the respondent's reference trip, one sailing more, and two sailings more;
 - Wait time before boarding for walk-on and off-peak of 5 minutes;
 - Departure time for walk-on trips, with levels of the same as the respondent's reference trip, one sailing earlier, and two sailings earlier; and
 - Departure time for off-peak drive-on trips, either the first sailing before or the first sailing after the peak period.
- ❖ For the walk-on option, different levels of origin and destination-side travel were included:
 - Origin side: Dropped off at the terminal, parking at either \$4 or \$8/day, or shuttle to a transit center.
 - Destination side: Free shuttle to transit or parking for a 2nd car at either \$4 or \$8/day.



Methodology (Choice-Based Conjoint Overview - Cont.)

- ❖ In total, 1,317 respondents were asked to evaluate 12 scenarios; the scenarios are shown in [Appendix A: Scenario-by-Scenario Selections](#).
- ❖ Interestingly, but not unexpected, a large proportion of respondents (73%) selected the same mode option in 10 or more of the twelve choice sets; 40% selected the same mode option in all twelve sets.
 - There are two plausible explanations for these results:
 - Ferry riders who drive on during peak hours either cannot or won't change their travel behavior, or
 - The changes tested were within the riders tolerance' levels (i.e., there wasn't a big enough reward or pain inflicted, so riders stayed with current behavior).
- ❖ Several different iterations of the conjoint analysis were executed to create the best model for simulating what-if-scenarios.
- ❖ The results presented in this report most closely mirror the approach used in the 2008 mode shift study.
 - The analysis presented in the subsequent pages was created by Parametric Marketing, Vancouver, WA.
- ❖ For complete details of the analysis performed, please see [Appendix D](#).
 - The choice-based conjoint was turned into a simulation tool that can be used to run what-if-scenarios. The simulator and supporting information is available on the Technical Data CD in the folder labeled Mode Shift.



Executive Summary



Executive Summary

Executive Summary Introduction:

- ❖ The key question addressed by this mode shift research is how do ferry riders **trade-off boarding mode, mode fare and time of sailing**. To answer that question, a choice-based conjoint exercise was utilized, and a market simulator developed, to forecast rider behaviors.
 - When evaluating the responses to the trade-off exercise, three in four (73%) selected the same mode option in 10 or more of the twelve choice sets and 40% selected the same mode option in all twelve sets. Meaning that many riders are not likely to change behavior under the conditions tested.
- ❖ **Definitions used in the report:** The following are the key definitions used in the report:
 - **Discretionary travel** is personal business/activities, travel to/from family/friends, tourism/recreational, travel to/from special events, shopping excursions, travel to/from vacation home/property, and multiple reasons/combined trips.
 - **Non-Discretionary travel** includes commuting to and from work, work related activities/business, medical appointments, commuting to and from school, and commuting to and from the airport.
 - **Mode shift consideration**, as used in this report, describes the extent peak vehicle drivers trade off different attributes/levels in deciding to 1) continue to drive-on at peak, 2) walk-on at peak, 3) drive-on before the peak period, or 4) drive-on after the peak period.
 - **Making peak drive-on less attractive** was done by increasing the cost differential between driving-on at peak vs. walk-on at peak or off peak drive-on plus increasing wait time for peak drive-on was used to make driving-on at peak less attractive to peak vehicle drivers.
 - **Base case simulation** reflexes the attributes levels closest to current fares, current wait times, and other current travel conditions thus mirroring the current market conditions. This was used to compare all other simulations to determine shifts in mode behavior.
 - **Percentage point change is not the same as percent change:** This report uses percentage point change, which is the numeric difference in the percents not the percent change which is the change in the numbers over the starting percent. (i.e., the change from 10% to 12% is a 2 “percentage point” increase and it is also a 20% increase (2%/10%)).



Executive Summary

Executive Summary Key Findings

- ❖ **Boarding mode:** Boarding mode has the greatest impact on peak vehicle drivers' decisions regarding how and when they travel on the ferry. The four general boarding modes tested were 1) Continuing to drive-on at peak, 2) Switching to walk-on at peak, 3) Switching to driving on before the peak period or 4) Switching to driving on after the peak.
 - Overall, behavior is dominated by the impact of the general boarding mode used - it carries twice the weight of any other attribute tested.
 - Boarding mode shows a higher impact for discretionary than non-discretionary trips, which likely indicates that commuters see fewer options for mode shift than people travelling for other purposes.
- ❖ **Mode fare** charged is a greater consideration to discretionary than non-discretionary riders indicating that commuters are less price sensitive.
 - The impact of the mode fare charged is approximately equal to how you will both get to the ferry and to your destination and whether you will have additional wait time if you drive-on at peak, indicating that price is not the only driver of behavioral change for on peak drivers.
- ❖ **Time of Sailing** finds that having to wait 1 more boat isn't as critical in mode shift consideration as a 2 boat wait for non-discretionary riders, while discretionary riders are more sensitive to additional boat waits.
 - More impactful than a 25% increase in fares is an additional one/two ferry boat wait for peak vehicle drivers. By increasing the wait time to one or two sailings during peak hours, there could be a 10-13% point decline in peak drive-on behavior with the majority switching to walk-on and off peak drive-on. This shows the relative importance of service (runs) over fares to peak vehicle drivers



Executive Summary (cont.)

- ❖ Switching to **driving on before or after peak** finds there is relatively little difference between discretionary and non-discretionary riders towards which off-peak drive-on mode to take indicating that both are viewed equally good or bad.
 - Consideration of off-peak driving is higher for discretionary than non-discretionary riders. However, walking on is a greater negative consideration for discretionary than non-discretionary riders, indicating the lack of flexibility that discretionary travelers have and their desire not to give up their vehicle for their trip purpose.
- ❖ **Similar to the 2008 elasticity of demand findings**, peak vehicle drivers appear fairly price inelastic. In other words, a 1% fare increases will not cause a 1% decline in overall ferry ridership.
 - Making driving-on at peak less attractive as defined on page 5, peak drive-on behavior would decrease by 19 percentage points.
 - More importantly, the option “would stop traveling by ferries” would increase by ONLY 2 percentage points as peak vehicle drivers shift to either walking on at peak and driving on off-peak but continue using the ferries.



Executive Summary (cont.)

Simulation Results

- ❖ **Across the board fare increase simulation:** Increasing all vehicle and walk-on fares for peak or off-peak travel by the same percentage doesn't significantly change peak vehicle drive-on behavior.
 - A 10% across the board fare increase doesn't impact travel behavior significantly as the study found only a 1 percentage point decrease in peak vehicle usage.
 - A 25% across the board fare increase would produce a 3 percentage point decrease in total ridership.
 - More discretionary peak vehicle drivers would stop using the ferries than their non-discretionary counterparts if there is a 25% across the board fare increase (5 vs. 3 percentage point decrease in ferry ridership respectively).

- ❖ **Increase in only peak drive-on fares simulation:** A 25% increase in only peak vehicle fares will create an 8 percentage point decrease in peak period vehicle usage.
 - When faced with a 25% peak vehicle fare increase, peak vehicle drivers will switch to off-peak vehicle travel rather than stop using the ferries.
 - Change to off-peak drive-on behavior is about double for discretionary vs. non-discretionary riders (7 vs. 4 percentage point shift to off-peak).
 - There is little change in both walk-on at peak and the "would not travel by ferry" percentage with a 25% peak vehicle fare increase.
 - The increase in "would not ride" is similar for both discretionary (2 percentage point increase) and non-discretionary (1 percentage point increase) riders when only peak drive-on fares are increased.
 - The increase in walk-on at peak is similar for both discretionary (1 percentage point increase) and non-discretionary (2 percentage point increase) riders when only peak drive-on fares are increased.



Executive Summary (cont.)

- ❖ **Increase peak drive-on wait time simulation:** More impactful than a 25% increase in fares is an additional one/two ferry boat wait for peak vehicle drivers.
 - Increasing the wait time experienced by peak vehicle drivers by one or two sailings could decrease peak vehicle traffic by 10 to 13 percentage points with the majority switching to walk-on and off-peak drive-on.
 - This shows the relative importance of service (runs) over fares to peak vehicle drivers.

- ❖ **Congestion Pricing Simulation:** Peak vehicle drivers would not stop using the ferry system but 4 percentage points more would switch to walk-on/off-peak travel if the peak drive-on fares went up 15%, while walk-on and off-peak fares went up by 5%.
 - The decrease in drive-on at peak behavior is greatest among discretionary vs. non-discretionary riders (4 vs. 2 percentage point decline).
 - The increase in “would not use ferries” is only marginally greater for discretionary vs. non-discretionary riders (2 vs. 1 percentage point increase).



Detailed Study Findings



Trade-off of Mode, Time and Price

(Choice-Based Conjoint Overview)

- ❖ The key question addressed by this mode shift research is how do ferry riders **trade-off boarding mode, time of sailing, and price**. To answer that question, a choice-based conjoint exercise was utilized and a market simulator developed to forecast rider behaviors.
 - A simulator based on choice-based conjoint analysis is a statistical technique used in market research to *determine how people value different features that make up an individual product or service*.
- ❖ The choice-based conjoint exercise employed to build the simulator included the following variables:
 - Ferry fares - Different levels (ranging from +25% to -20%) from current fares for driving on during peak (congested periods), driving on before/after peak, and walking on during peak;
 - Wait time before boarding for on-peak drive-on trips, with levels of the same as the respondent's reference trip, one sailing more, and two sailings more;
 - Wait time before boarding for walk-on and off-peak of 5 minutes;
 - Departure time for walk-on trips, with levels of the same as the respondent's reference trip, one sailing earlier, and two sailings earlier; and
 - Departure time for off-peak drive-on trips, either the first sailing before or the first sailing after the peak period.
- ❖ For the walk-on option, different levels of origin and destination-side travel were included:
 - Origin side: Dropped off at the terminal, parking at either \$4 or \$8/day, or shuttle to a transit center.
 - Destination side: Free shuttle to transit or parking for a 2nd car at either \$4 or \$8/day.



Trade-off of Mode, Time and Price

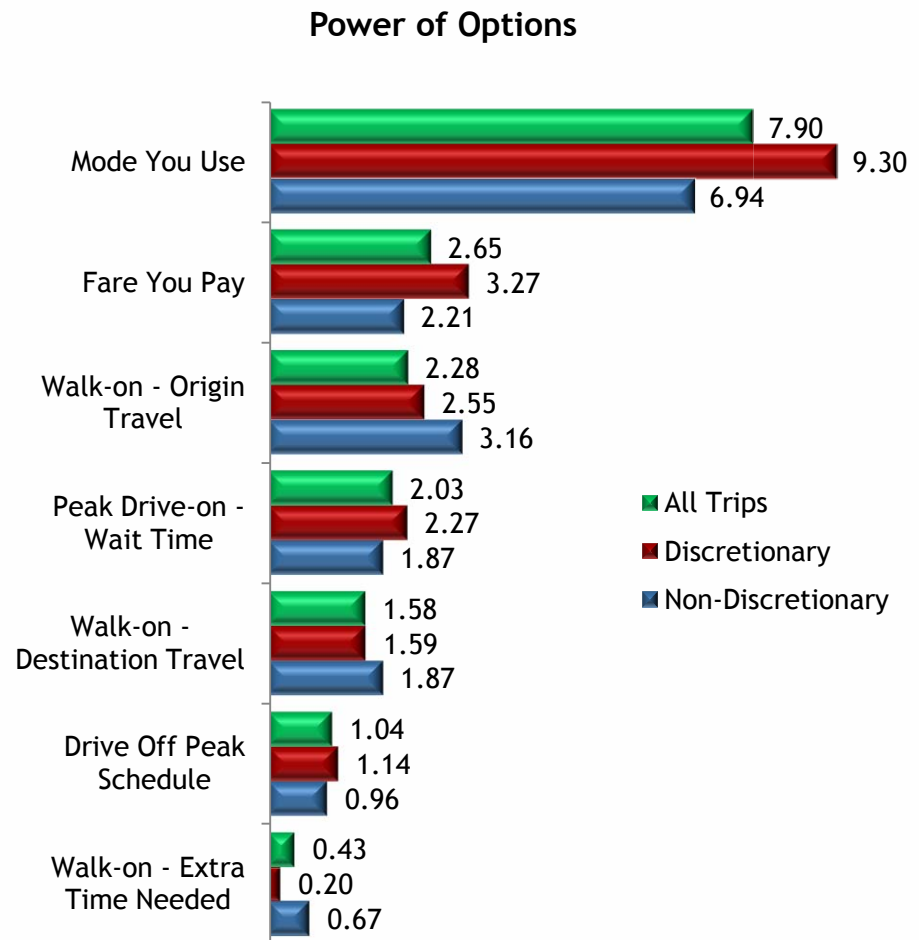
(Choice-Based Conjoint Overview - Cont.)

- ❖ In total, 1,317 respondents were asked to evaluate 12 scenarios; the scenarios are shown in [Appendix A: Scenario-by-Scenario Selections](#)
- ❖ Interestingly, but not unexpected, a large proportion of respondents (73%) selected the same mode option in 10 or more of the twelve choice sets; 40% selected the same mode option in all twelve sets.
 - There are two plausible explanations for these results:
 - Ferry riders who drive on during peak hours either cannot or won't change their travel behavior, or
 - The changes tested were within the riders' tolerance levels (i.e., there wasn't a big enough reward or pain inflicted, so riders stayed with current behavior).
- ❖ Several different iterations of the conjoint analysis were executed to create the best model for simulating what-if-scenarios.
- ❖ The results presented in this report most closely mirror the approach used in the 2008 mode shift study.
 - The analysis presented in the subsequent pages was created by Parametric Marketing, Vancouver, WA.
- ❖ The following pages show:
 - The **impact of the key attributes** tested on peak vehicle drivers' behavioral changes.
 - The **general elasticity of fares** on peak vehicle drivers' behavioral changes.
 - The **simulated mode and time shifting** results that peak vehicle drivers might do, given changes in the ferry fares, wait times and origin/destination travel offerings.



Impact of the Attributes Tested On Peak Vehicle Drivers' Behavior

- ❖ The bars show the relative "power" of each of the attributes tested on peak vehicle drivers' behavioral change. The higher the number, the more weight it has relative to the other attributes.
- ❖ Overall, behavior is dominated by the impact of the mode used (drive-on at peak, walk-on at peak, or drive-on before/after peak) - it carries twice the weight of any other attribute tested.
- ❖ The decision on what mode to use is more important to those traveling for discretionary than non-discretionary purpose. Which could mean that commuters are more able to use multiple modes than non-commuter riders.
- ❖ The mode fare charged is a greater consideration to discretionary than non-discretionary riders. This indicates that commuters are less price sensitive due to their overriding need to get to their destination at a fixed time.
- ❖ The impact of the mode fare charged is approximately equal to how you will both get to the ferry and to your destination and whether you will have additional wait time if you drive-on at peak. This shows that price is not the only driver of behavioral change for on-peak drivers.

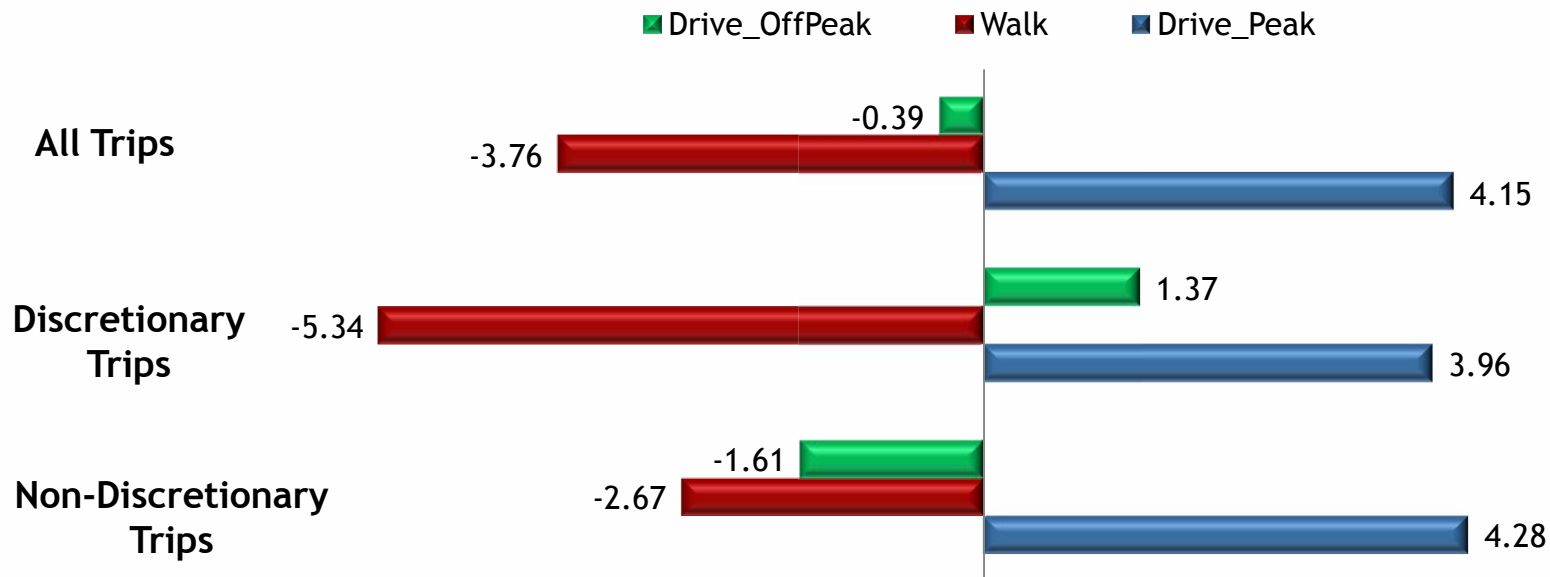




How To Read Impact Slides

Introduction to Impact Section:

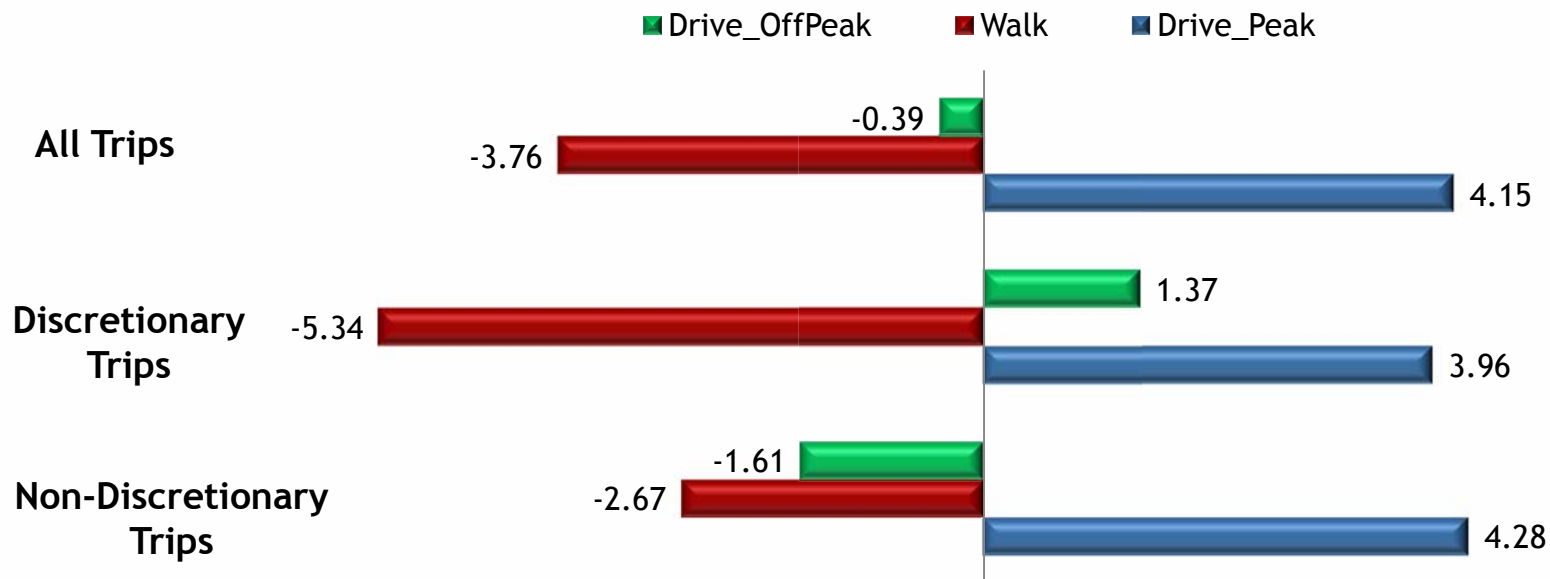
- ❖ The following set of slides show how peak vehicle drivers weigh the different travel aspects.
- ❖ The absolute distances between the end points of the bars show the relative difference of each.
 - ❖ Bar end points close to each other are perceived as similar options (i.e., there is little distinction between the two options in the rider's opinion). Bar points -1.61 and -2.67 are close and non-discretionary peak vehicle riders would see them as interchangeable options (i.e., driving off peak or walking at peak are similar).
 - ❖ Bar ends point further away are perceived as unique options (i.e., the rider has definite opinions about which they would choose to do). Bar points -5.34 and 3.96 would suggest that discretionary peak vehicle drivers see these as not interchangeable (i.e., I don't want to give up my car).





Impact of Mode On Peak Vehicle Drivers' Behavior

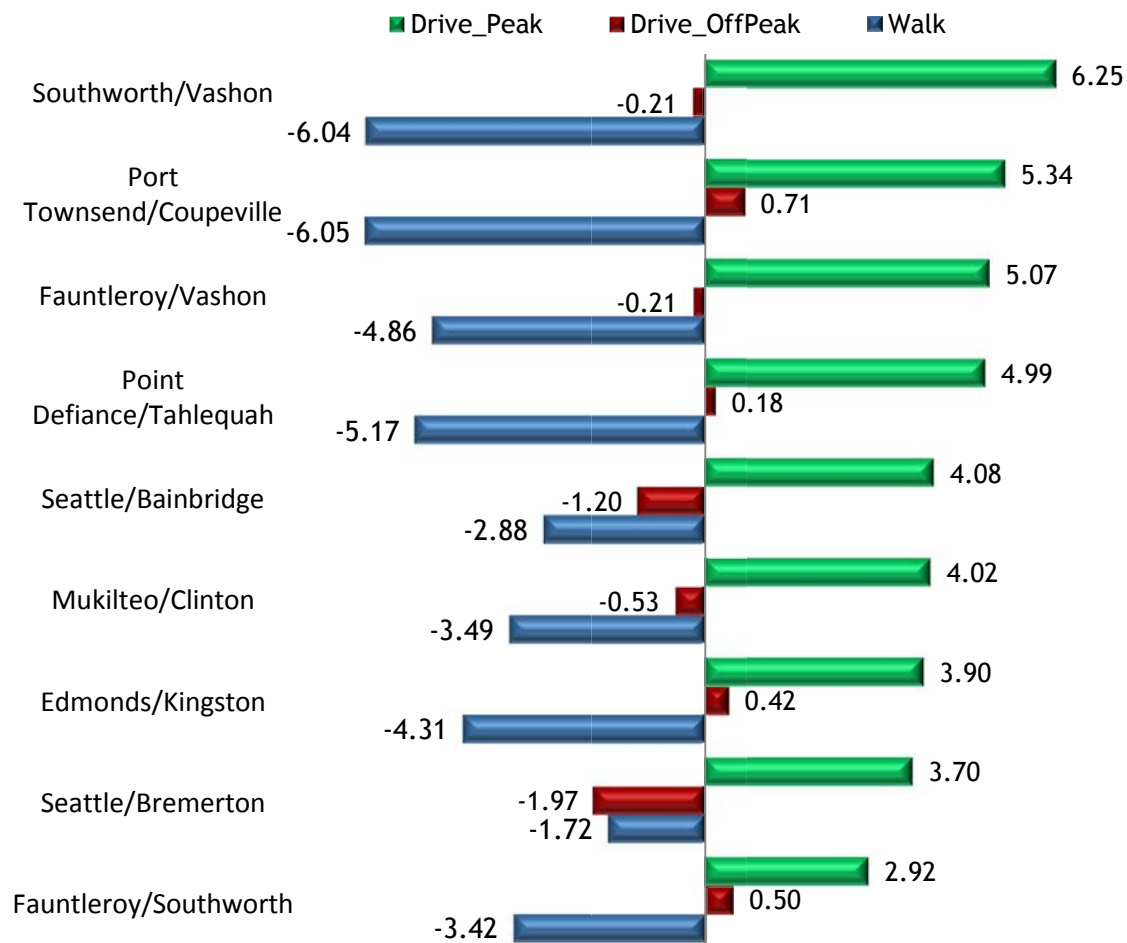
- ❖ Ability to switch from driving on at peak to off-peak driving is higher for discretionary than non-discretionary riders. (3.96 to 1.37 vs. 4.28 to -1.61 respectively)
- ❖ Walking on has a greater negative consideration for discretionary than non-discretionary peak vehicle drivers. (3.96 to -5.34 vs. 4.28 to -2.67 respectively)
- ❖ These two points show the lack of flexibility that discretionary travelers have and their desire not to give up their vehicle for their trip purpose.





Impact of Mode On Peak Vehicle Drivers' Behavior (by Route)

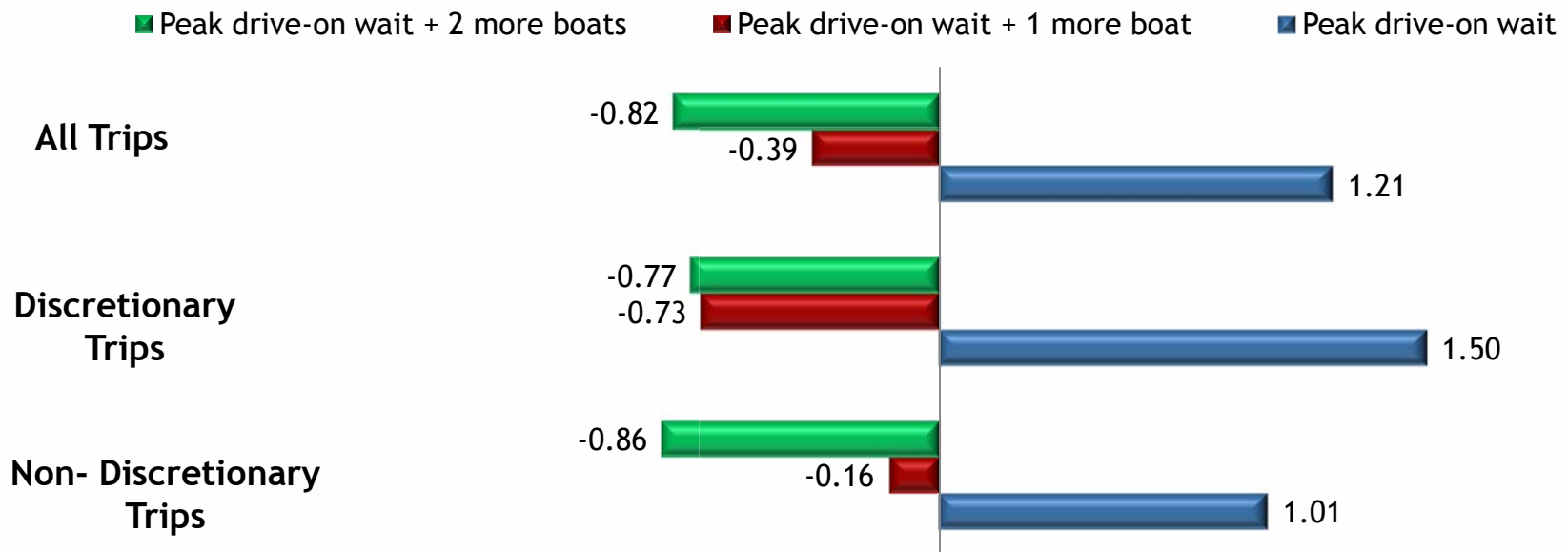
- ❖ It is more difficult for peak vehicle drivers to change their ferry mode to walk-on for the routes of Pt Townsend / Coupeville, Southworth / Vashon, Pt Defiance / Tahlequah routes. (6.25 to -6.04, 5.34 to -6.05 and 4.99 to -5.17 respectively)
- ❖ This indicates that walking on is not a viable option on these routes in peak vehicle drivers' minds.





Impact of Increased Wait Time On Peak Vehicle Drivers' Behavior

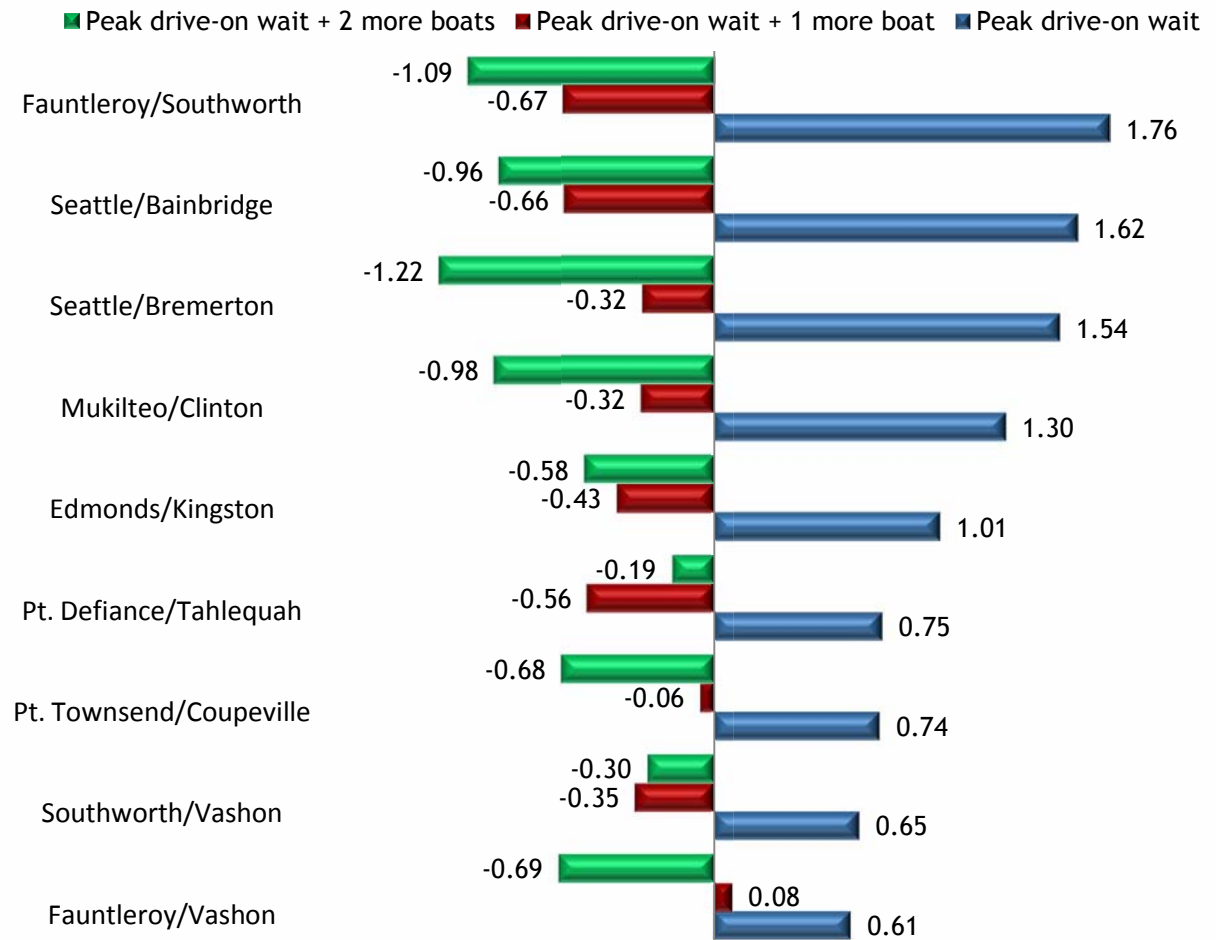
- ❖ For non-discretionary peak vehicle drivers, having to wait 1 more boat isn't as critical in their consideration of which mode to use as a 2 boat wait. (1.01 to -0.16 vs. 1.01 to -0.86 respectively)
 - This would suggest that non-discretionary peak vehicle drivers build in the potential of a one additional boat wait into their travel planning.
- ❖ Discretionary peak vehicle drivers are most sensitive to any additional boat waits (this is seen in that -0.77 and -0.73 being almost the same value)
- ❖ These findings would suggest that discretionary peak vehicle drivers do not typically plan for additional boat waits in their trip schedule.





Impact of Increased Wait Time On Peak Vehicle Drivers' Behavior by Route

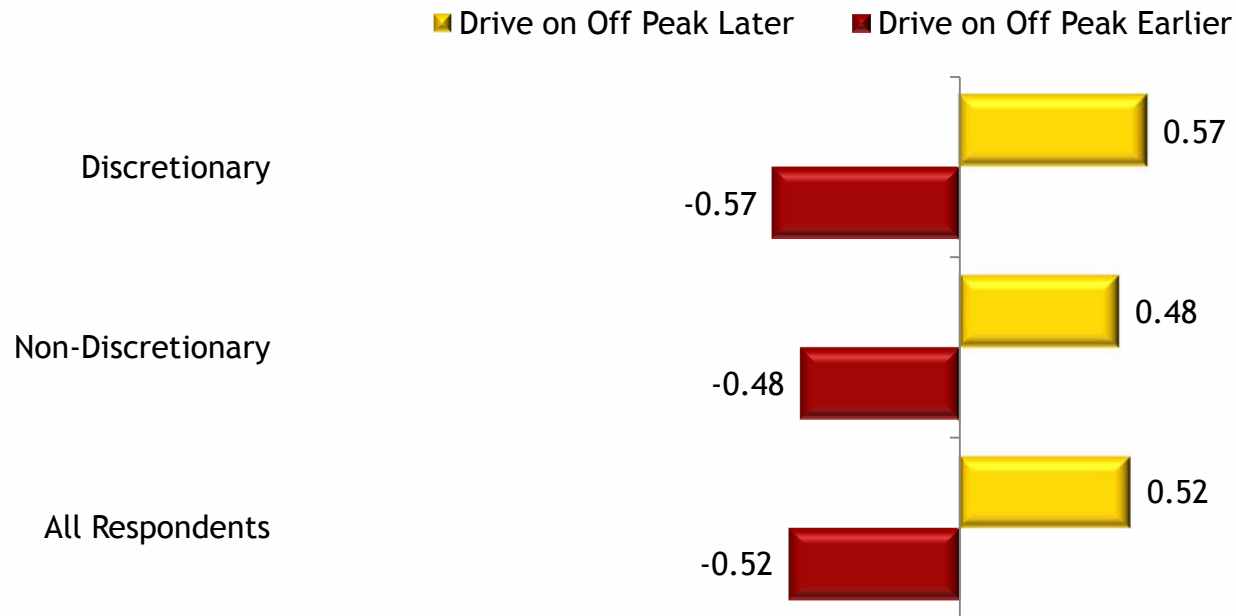
- ❖ Avoiding 1 or more additional boat waits is strongest for peak vehicle drivers on the Fauntleroy / Southworth, Seattle / Bainbridge, and Seattle / Bremerton routes. (1.76 to -0.67, 1.62 to -0.66, and 1.54 to -0.32 respectively)
- ❖ This would indicate that peak vehicle riders on these routes would be motivated to change mode used more by cuts in service than peak vehicle drivers on other routes.





Impact of Taking an Earlier or Later Boat On Peak Vehicle Drivers' Behavior

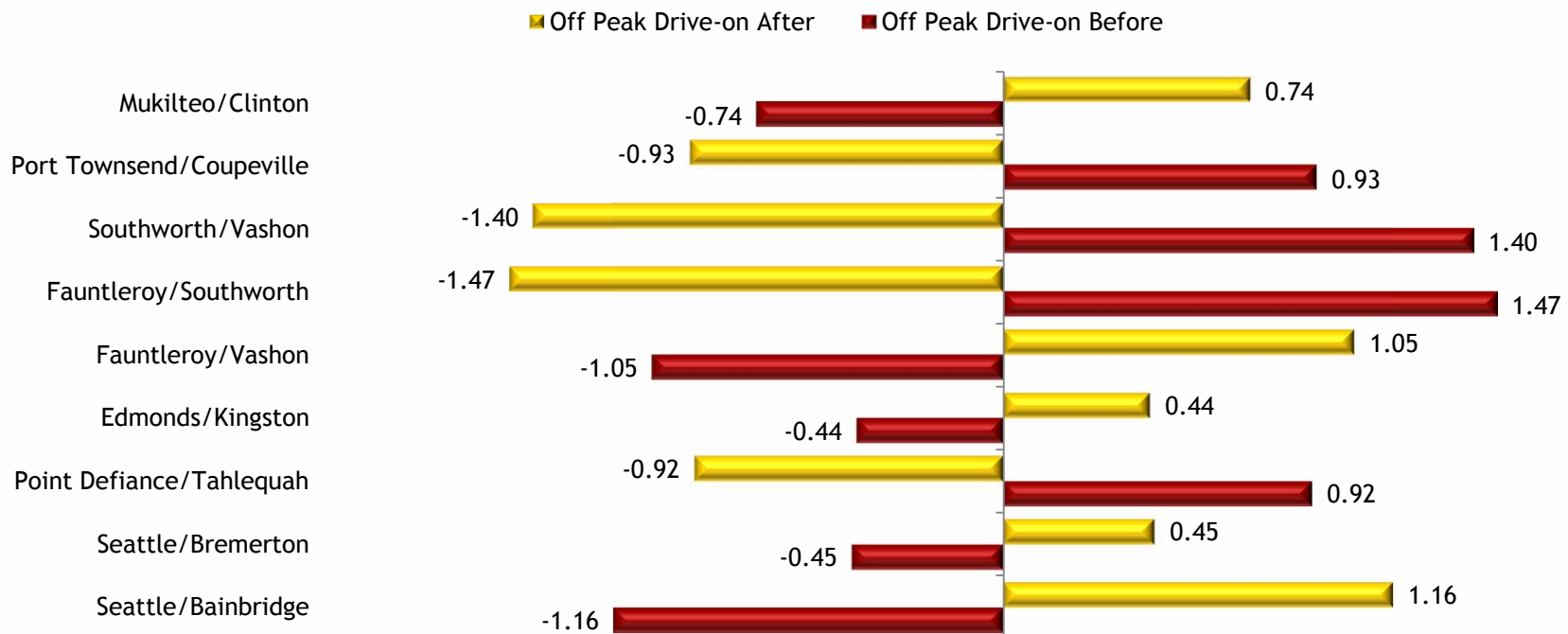
- ❖ There is relatively little difference for both discretionary and non-discretionary peak vehicle drivers towards the options of driving off-peak either earlier or later. (There is little difference in the values below)
 - In other words, taking the boat before peak is just as good or bad as taking the boat right after the peak period to peak vehicle drivers.
- ❖ This would suggest that if peak vehicle drivers should elect to move their trip to an off-peak time, they will do so roughly equally versus over loading the first sailing before/after the peak period.





Impact of Off-Peak Drive on Schedule On Peak Vehicle Drivers' Behavior by Route

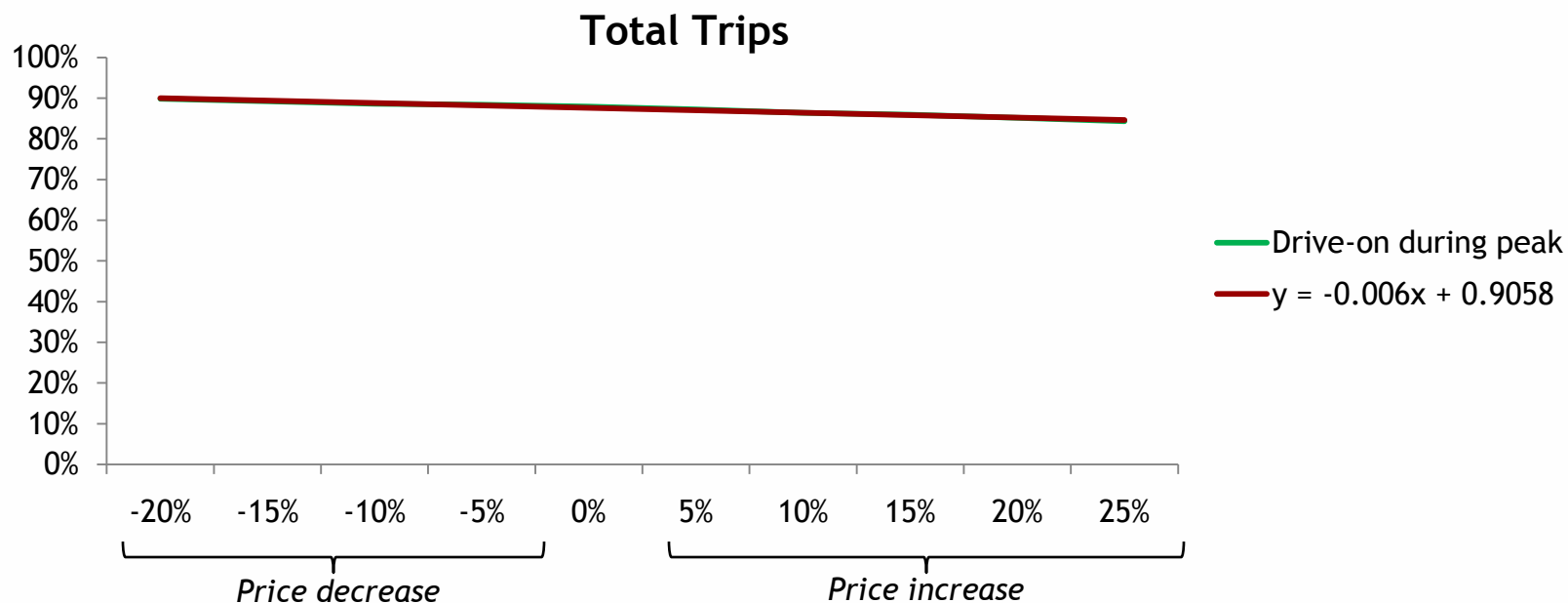
- ❖ This route graph shows how much variance there is in peak vehicle drivers' feelings about taking an earlier or later off-peak ferry (compared to the previous "total" slide).
- ❖ The group shows that some routes peak vehicle drivers prefer after and some prefer before (not all right side bars are yellow).
- ❖ Interesting, when compared by route, taking the first off peak sailing (either before or after peak) is more of a consideration to those riding the Fauntleroy / Southworth and Southworth / Vashon runs (their total bar lengths vs. other route total bar lengths).
 - For those routes, this suggests that peak vehicle drivers do see a larger difference in which they catch the before or after peak boat.





Impact of Fare Levels On Peak Vehicle Drivers' Behavior

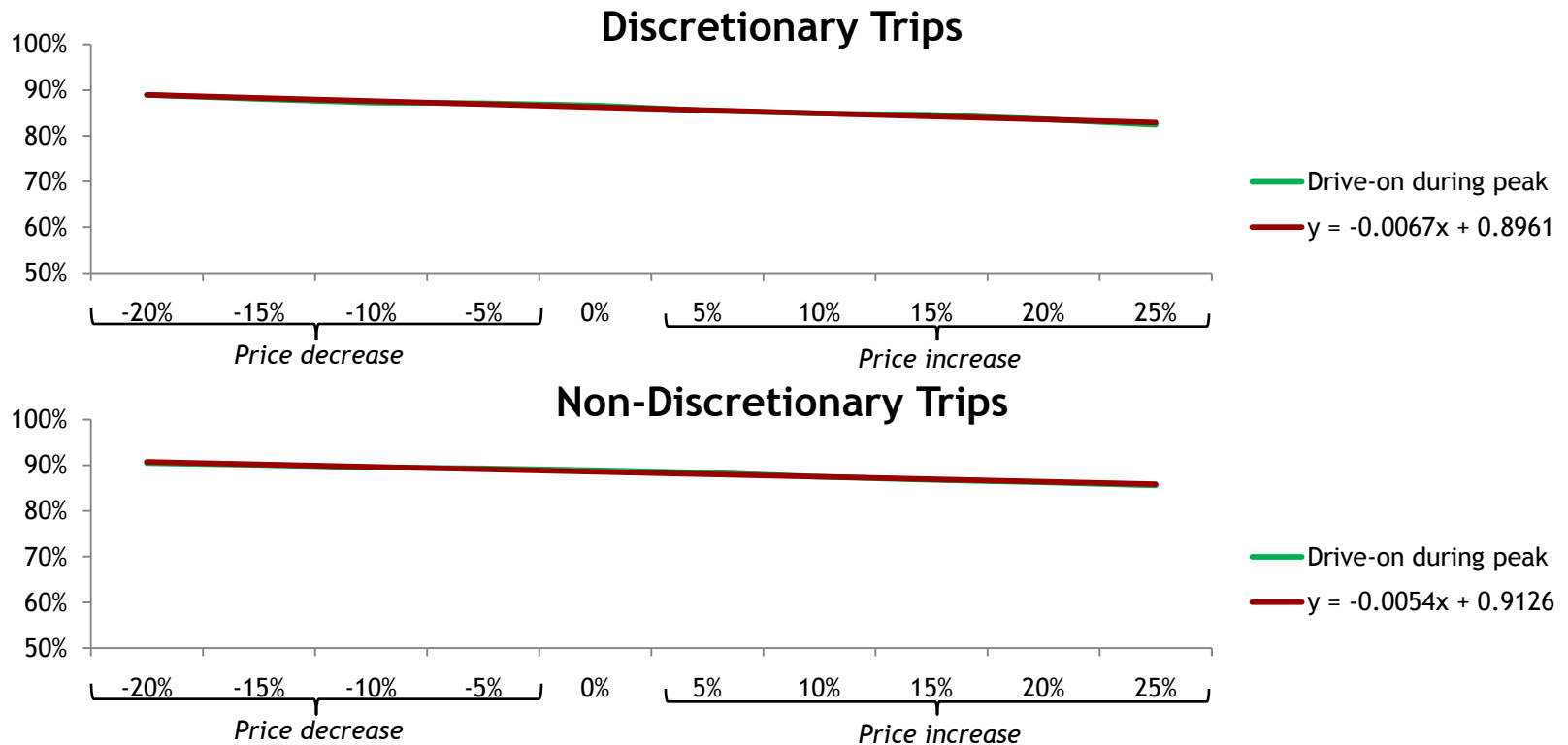
- ❖ Similar to the 2008 results, the 2010 study found that there is very little decline in ridership as the fares are increased.
 - Elasticity is a measure of the impact of increasing fares on ridership. Increases in fares are said to be inelastic when a 1% increase in fares does not cause at least a 1% decrease in ridership. The slope of the line (the number in front of the "X" value where "X" is the fare increase) indicates how elastic or inelastic the relationship between fare increases and ridership are. The closer to "0" that number is, the more inelastic fares are said to be. The slope of the line (-.006) shows that fares are inelastic up through a 25% increase.
- ❖ NOTE CONCERNING CONJOINT MODEL RESULTS: At the current price (+/-0% of what the rider actually paid) the model predicts that 12% of the peak vehicle drivers "would not use" the ferry for a similar peak vehicle trip. This doesn't mean an "instant" 12% decrease in peak vehicle volume. While peak vehicle drivers we interviewed may leave the system for "unknown" reasons, riders we did not talk to (because of the screen criteria) will be traveling at peak times. In comparison, the similar 2008 elasticity study figure for "would not use" the ferries was 8%.





Impact of Fare Levels On Peak Vehicle Drivers' Behavior by General Trip Purpose

- ❖ The 2010 study found that there is very little decline in ridership as the fares are increased for both discretionary and non-discretionary peak vehicle drivers (.0067 vs. .0054 respectively).
 - The inelasticity of fares are very similar for both discretionary and non-discretionary peak vehicle drivers.

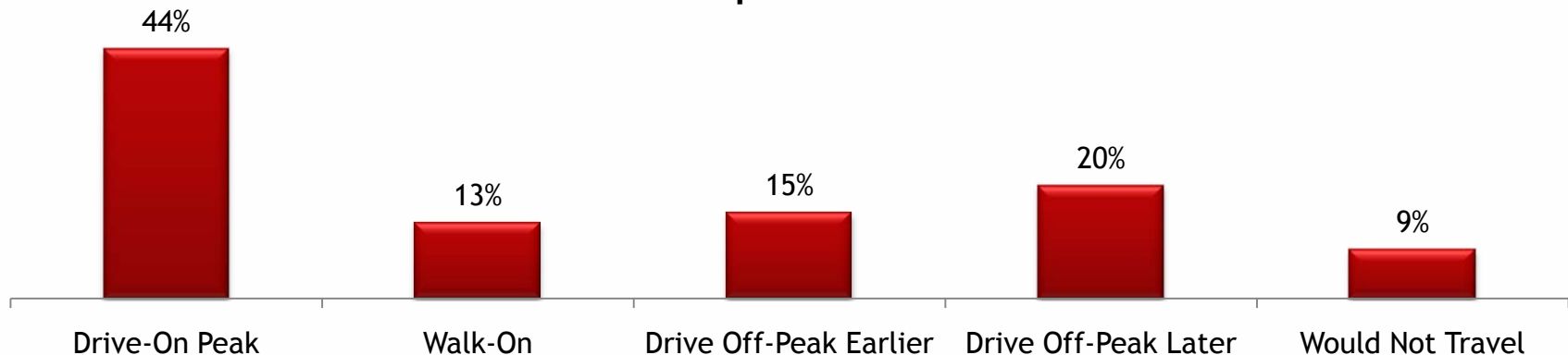




How To Read Simulation Slides

- ❖ To predict future behavior, we gave peak vehicle drivers 12 difference scenarios showing different levels of fares and wait times for driving on at peak, walking on at peak, and driving on off-peak (see appendix A for the 12 scenarios used).
- ❖ We then used a mathematical routine (choice-based conjoint program) to simplify the findings into a model that predicts future behavior.
- ❖ A “base case” is then created with attribute values closest to the current fares and wait times experienced by peak vehicle drivers.
- ❖ The simulation result slides on the following pages show what the model would predict peak vehicle drivers would do if they were faced with different levels of fares and wait times compared to the “base case” (current fare/wait time levels).
- ❖ The chart below shows the simulation base case for combined discretionary and non-discretionary peak vehicle trips.
 - The model predicts that 44% of peak vehicle drivers will continue to drive on at peak in the future. The balance (56%) would switch to walk-on at peak (13%), drive-on off-peak (35% either first boat before or after peak period), or “would not use” the ferry to make that trip (9%).
 - The importance is not the absolute percentage of any one bar, but the relative change to the base case as fare, wait, and other factors are changed.

Total Trips - Base Case





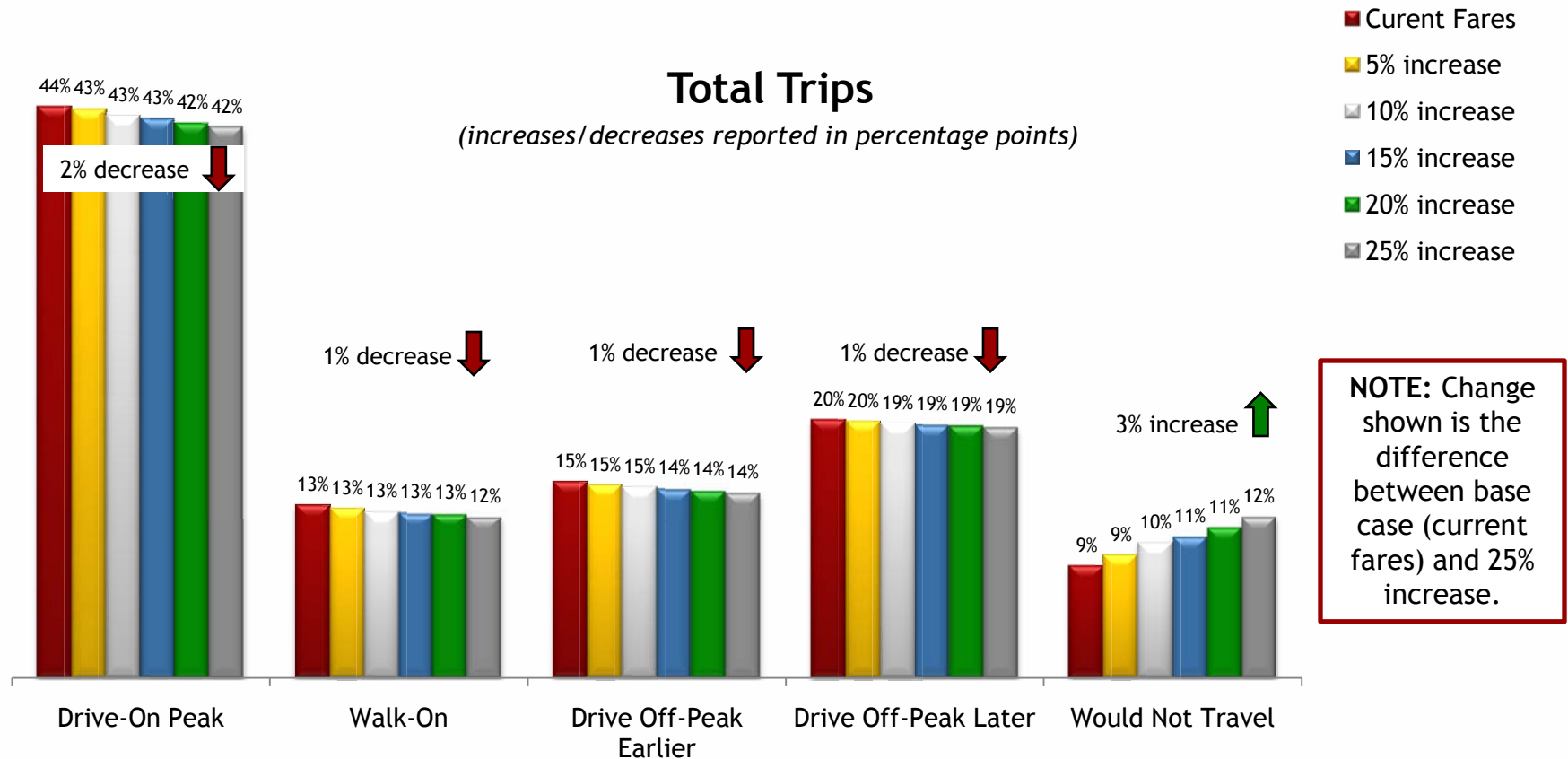
Simulations

- ❖ The following slides show the predicted change in behavior if:
 - *Both drive-on and walk-on fares were increased by the same percentage*
 - *Only peak drive-on fares were increased while holding walk-on and off-peak at current levels*
 - *Wait times for peak vehicle drivers increased by one or two additional boats*
 - *Everything was done to make drive-on at peak less attractive*
 - *There was a 10% across the board fare increase established*
 - *Peak drive-on fares went up 15% while walk-on and off-peak drive-on fares went up by 5%*



Simulator Result: Across the Board Fare Increases

- ❖ Raising drive-on and walk-on fares by the same percentage does not change the mode peak vehicle drivers will use.
- ❖ The overall result of the 25% fare increase could be a 3 percentage point decrease in total ridership.



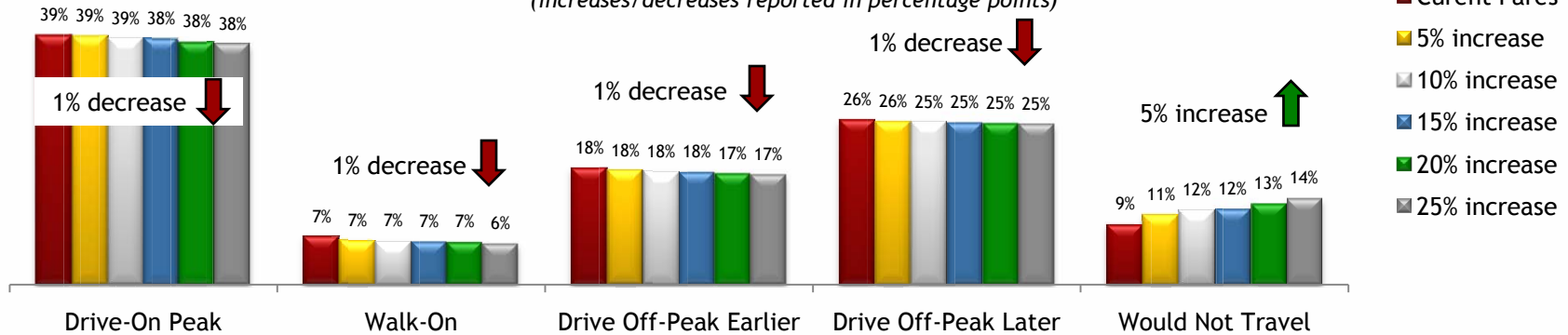


Simulator Result: Across the Board Fare Increases

- ❖ If fares are raised across the board by 25%, 5 percentage points more peak vehicle drivers taking discretionary trips would elect to **not** use the ferries as compared to those who are taking non-discretionary trips (3 percentage points).
- ❖ All other changes in mode are similar between peak vehicle drivers regardless of trip purpose.

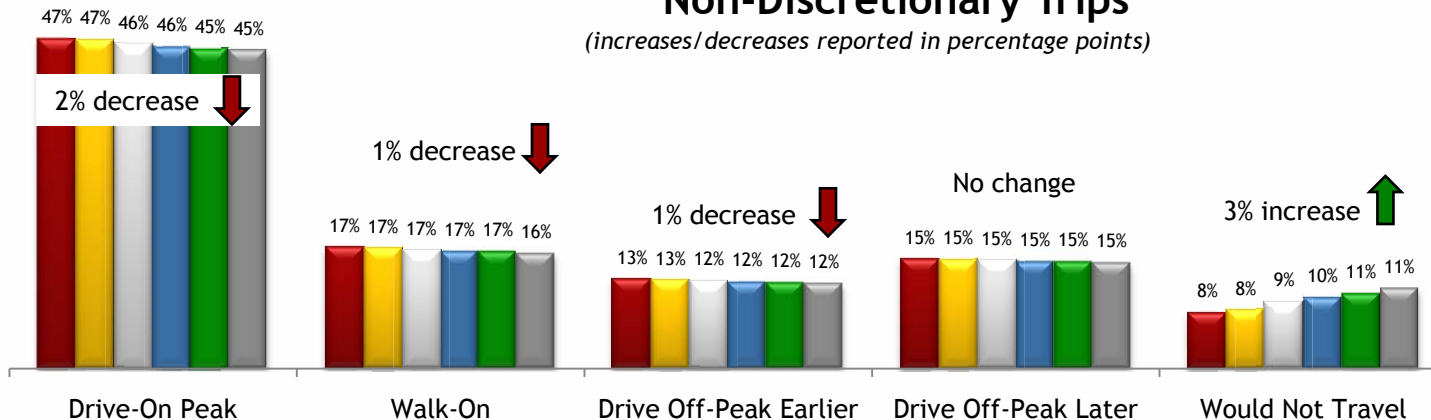
Discretionary Trips

(increases/decreases reported in percentage points)



Non-Discretionary Trips

(increases/decreases reported in percentage points)



NOTE: Change shown is the difference between base case (current fares) and 25% increase.



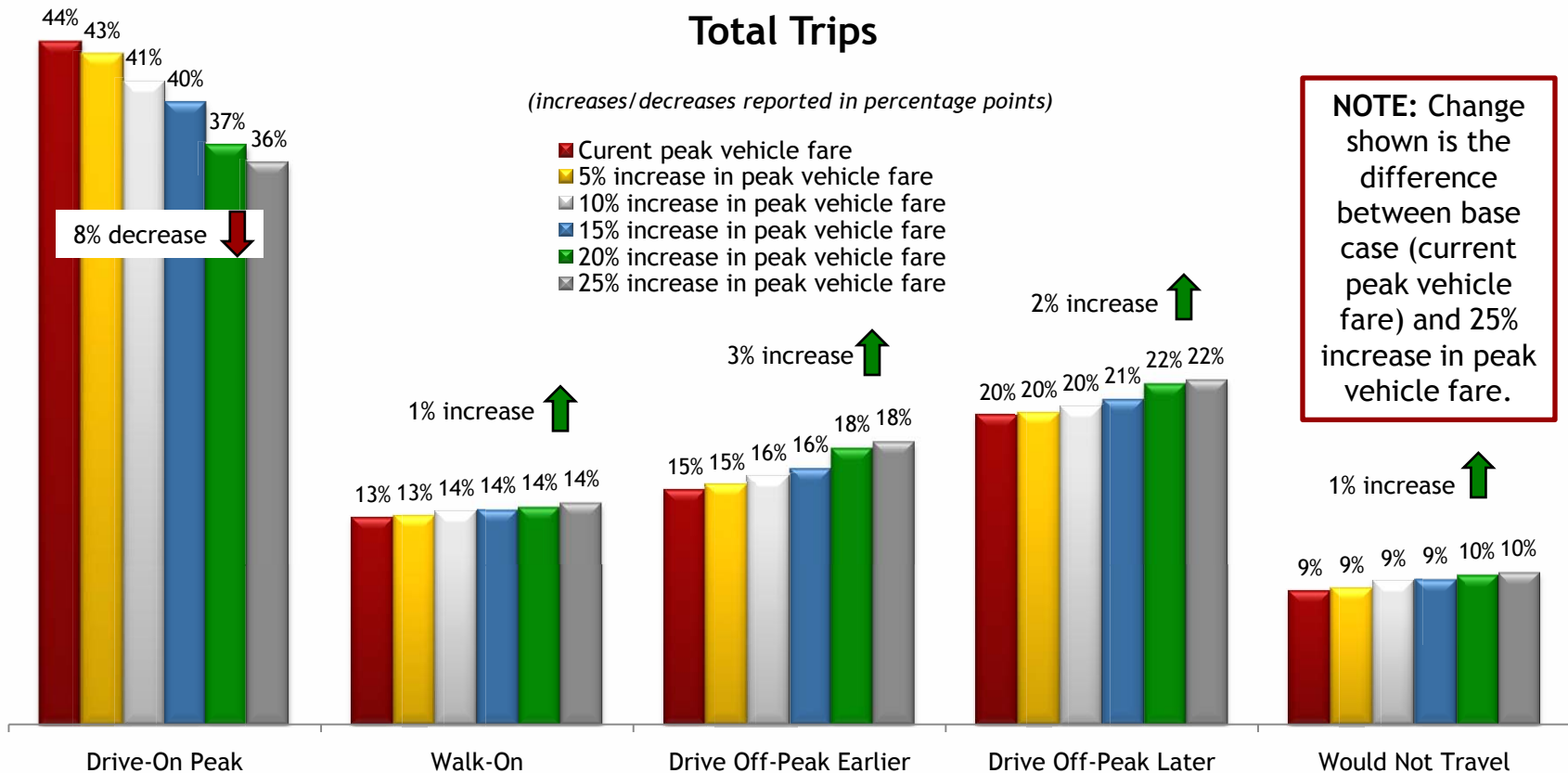
Simulator Result: *Increase in Only Peak Vehicle Fares*

- ❖ By increasing ONLY peak vehicle fares, there is an 8 percentage point decrease in peak period drive-on vehicle usage.
- ❖ There is a 5 percentage point increase in off-peak (either first boat before or after the peak period) drive-on behavior.
- ❖ There is little change in either the “would not travel” percentage or walk on at peak (1 percentage point increase each).

Total Trips

(increases/decreases reported in percentage points)

- Current peak vehicle fare
- 5% increase in peak vehicle fare
- 10% increase in peak vehicle fare
- 15% increase in peak vehicle fare
- 20% increase in peak vehicle fare
- 25% increase in peak vehicle fare



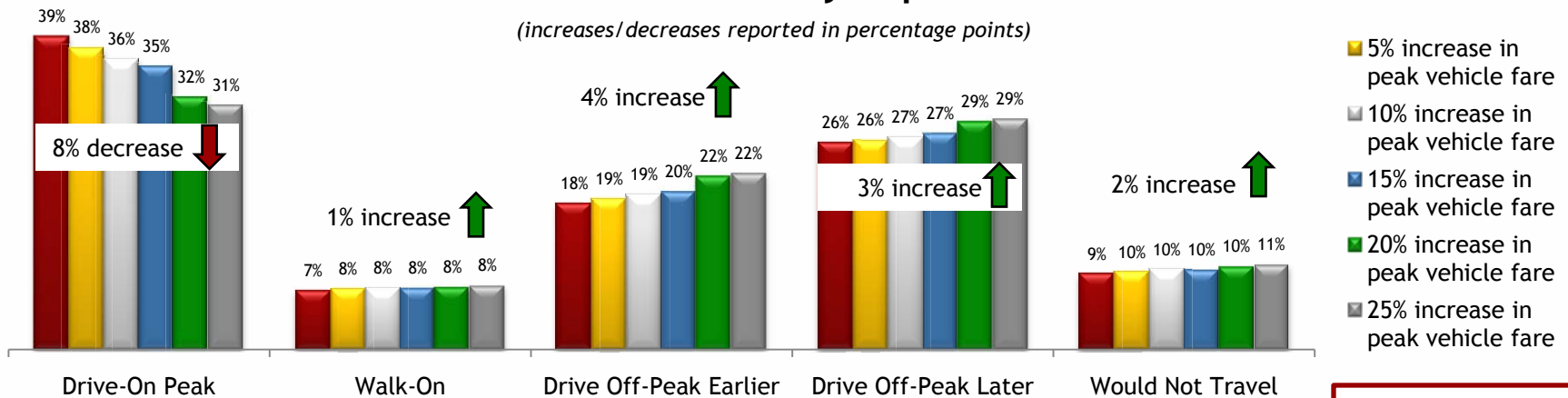


Simulator Result: *Increase in Only Peak Vehicle Fares*

- ❖ Increasing only peak vehicle fares moves slightly more discretionary riders to off-peak travel than their non-discretionary counterparts (7 vs. 4 percentage points respectively).

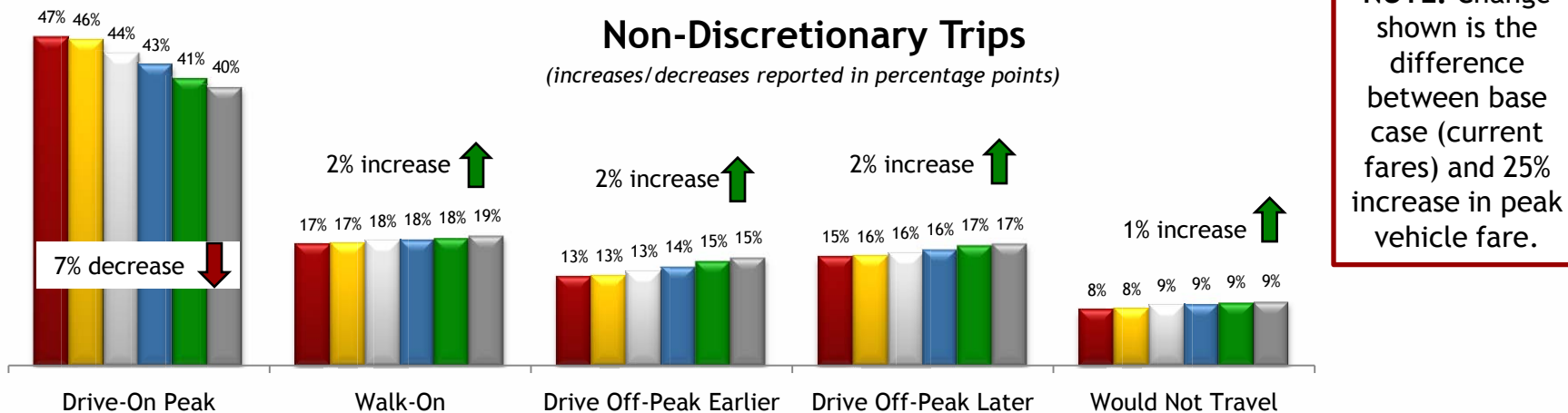
Discretionary Trips

(increases/decreases reported in percentage points)



Non-Discretionary Trips

(increases/decreases reported in percentage points)

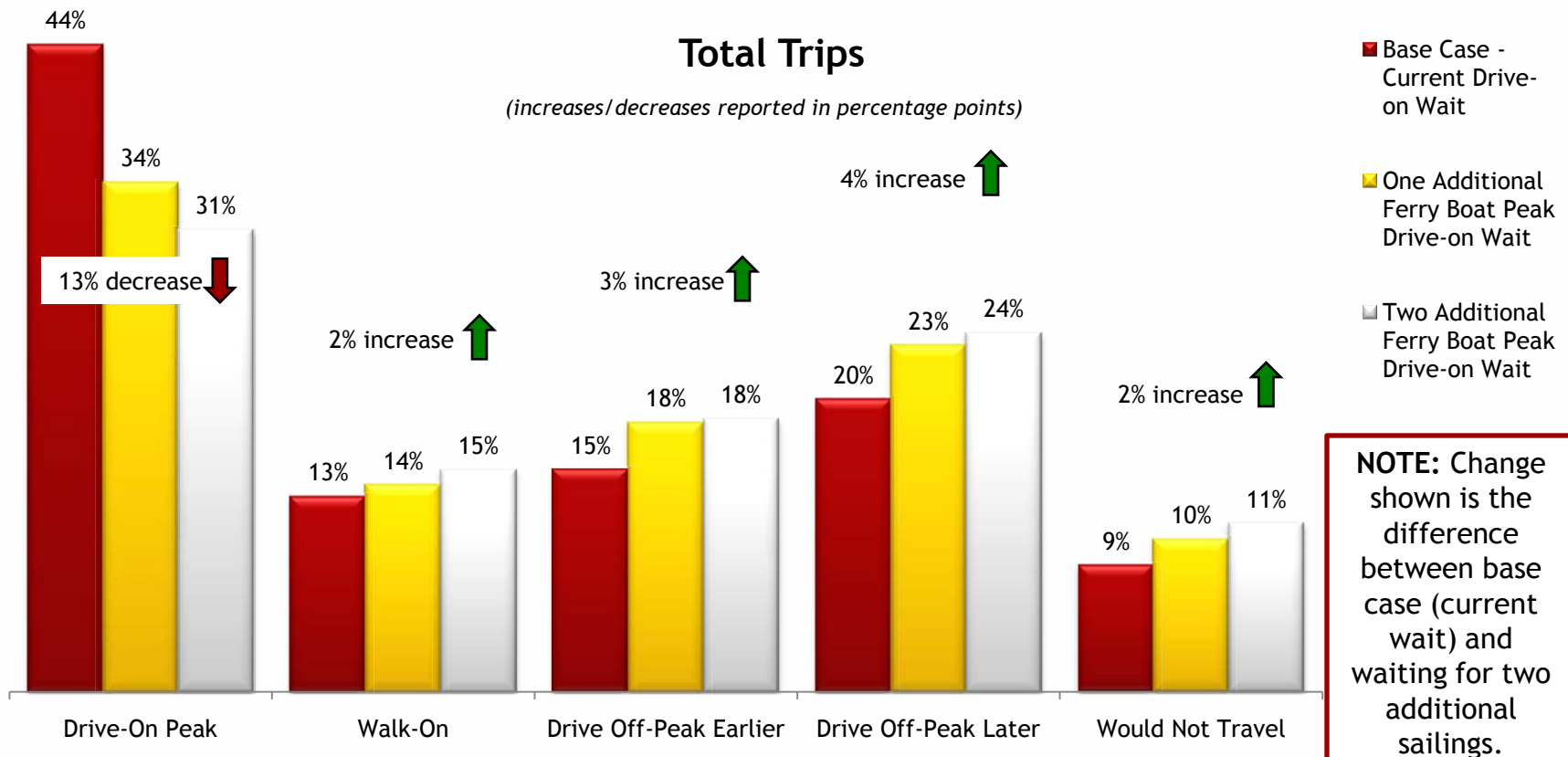


NOTE: Change shown is the difference between base case (current fares) and 25% increase in peak vehicle fare.



Simulator Result: *Increases in Wait Time for Peak Vehicle Drivers*

- ❖ More impactful than a 25% increase in fares is an additional one/two ferry boat wait for peak vehicle drivers.
 - By increasing the wait time to one or two sailings during peak hours, there could be a 10-13 percentage point decline in peak drive-on behavior with the majority switching to walk-on (2 percentage points) and off peak drive-on (7 percentage points either first boat before or after peak) .
- ❖ This slide shows the relative importance of service (runs) over fares to peak vehicle drivers.



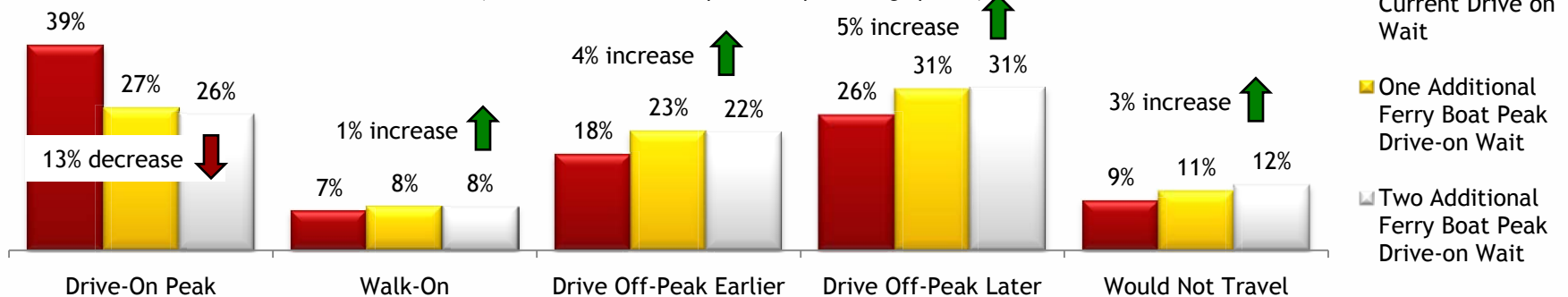


Simulator Result: *Increases in Wait Time for Peak Vehicle Drivers*

- ❖ One additional boat wait has a higher impact (12 percentage point decline) on discretionary peak vehicle drivers than their non-discretionary counterparts (8 percentage point decline).
- ❖ More non-discretionary peak vehicle drivers will switch to walking on at peak than their discretionary counterparts (3 vs. 1 percentage points respectively).
- ❖ More discretionary peak vehicle drivers will switch to off-peak (earlier or later than peak) than their non-discretionary counterparts (9 vs. 7 percentage points respectively).

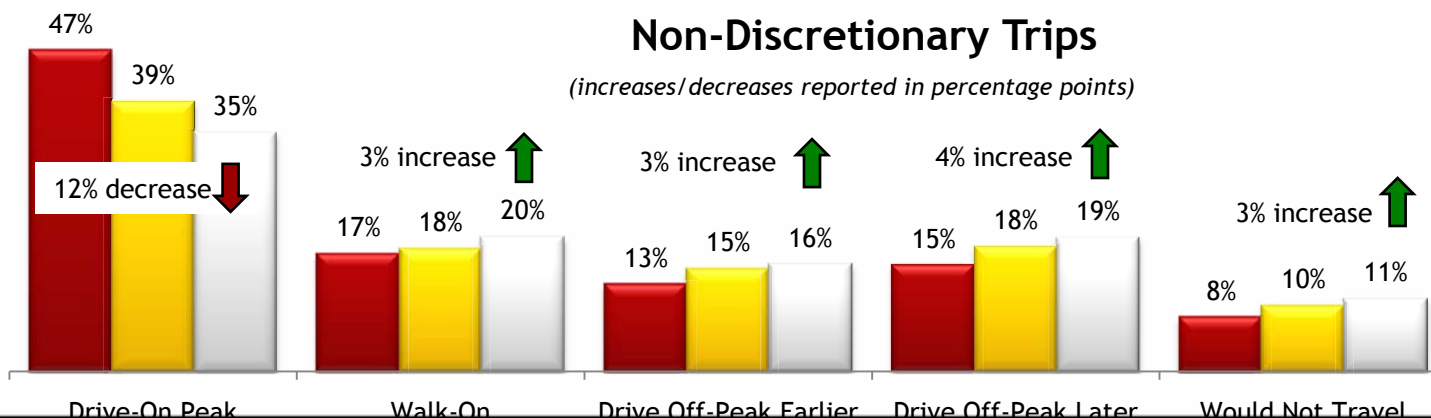
Discretionary Trips

(increases/decreases reported in percentage points)



Non-Discretionary Trips

(increases/decreases reported in percentage points)



NOTE: Change shown is the difference between base case (current wait time) and waiting for two additional sailings.



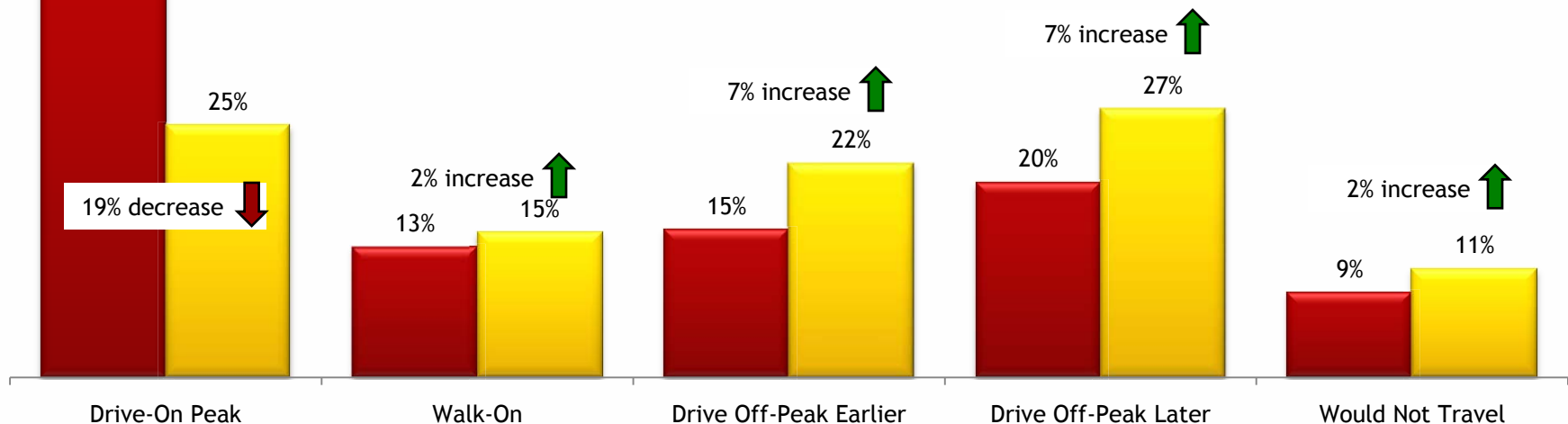
Simulator Result: Best vs. Base Case

- ❖ The graph below shows the results of making driving on at peak a less attractive option for drivers. This would represent the maximum mode shift based on the attributes tested.
 - To do this, the following levels were set for the best case; A 25% increase in peak vehicle fares; An additional 2 boat wait for peak vehicle drivers; A 20% decrease in walk-on fares; and A 20% decrease in off peak vehicle fares.
- ❖ By selecting the options that make driving on at peak relatively more costly in terms of money (45 percentage point spread between peak vehicle fares and off peak vehicle fares and walk-on fares) and time (2 additional boat wait for peak vehicle drivers), the simulation would suggest that a maximum of 19 percentage points of peak vehicle drivers can be shifted (2 percentage point increase in walk-on at peak and 14 percentage points in driving off-peak (either earlier or later)).
 - There would also be a total system-wide loss of ridership of 2 percentage points.

TOTAL: Base vs. Best Case

(increases/decreases reported in percentage points)

■ Base ■ Best



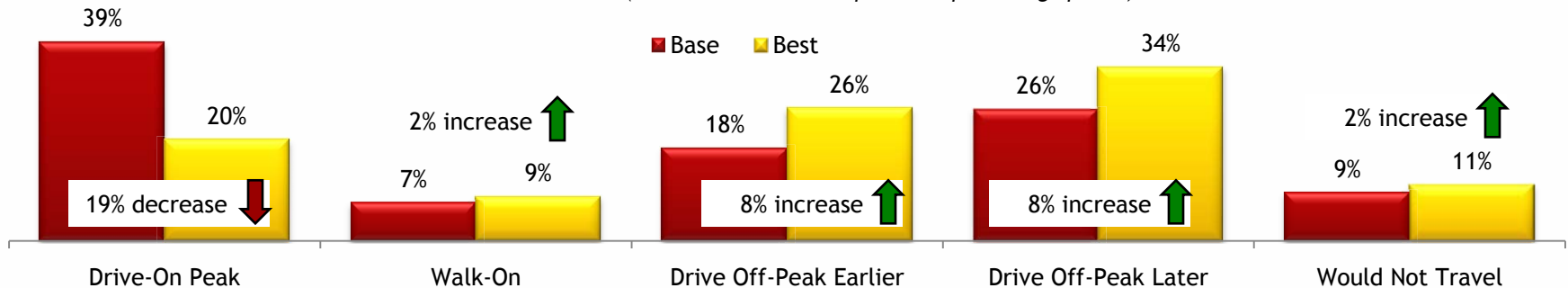


Simulator Result: Best vs. Base Case by Trip Purpose

- ❖ The graphs below show the results of making drive-on at peak the least attractive option for discretionary and non-discretionary peak vehicle drivers.
- ❖ There is a greater shift made from driving on at peak to taking either the first boat before or after peak by discretionary travelers versus their non-discretionary counterparts (16 vs. 13 percentage point increase).

Discretionary: Base vs. Best Case

(increases/decreases reported in percentage points)



Non-Discretionary: Base vs. Best Case

(increases/decreases reported in percentage points)



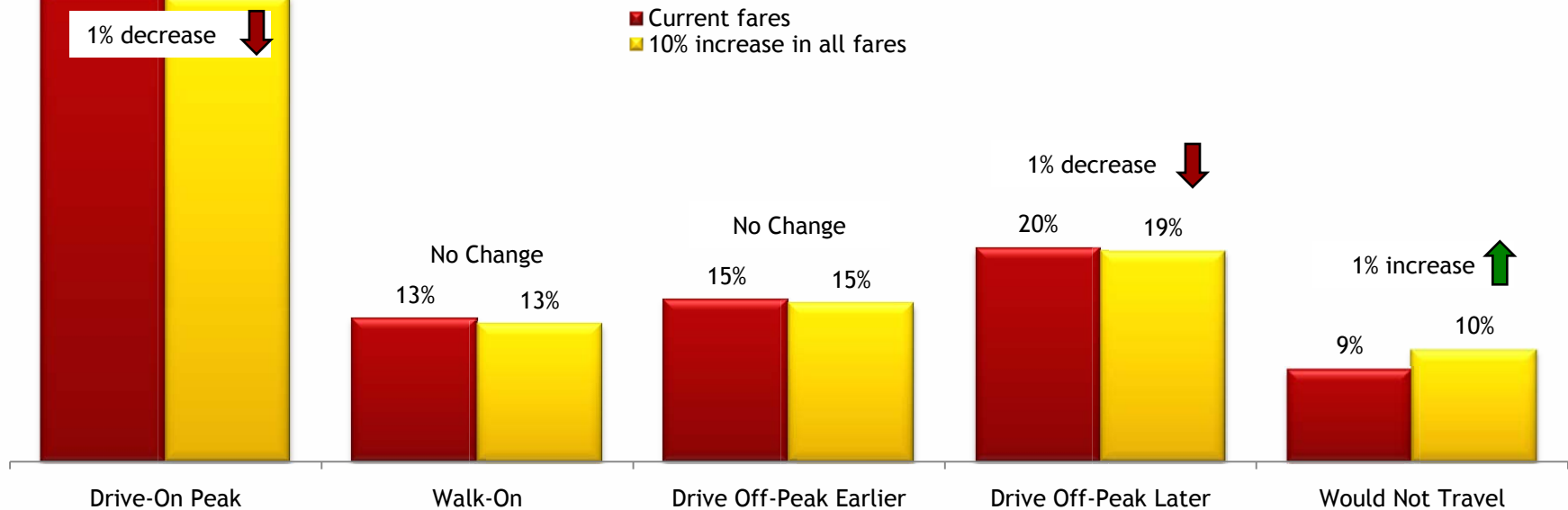


Simulator Result: 10% Across the Board Increase

- ❖ This simulation shows the results of enacting a 10% across the board increase.
- ❖ There is no real impact on mode shifting or overall ferry usage under a 10% across the board increase in fares.

TOTAL: 10% Across the Board Increase

(increases/decreases reported in percentage points)



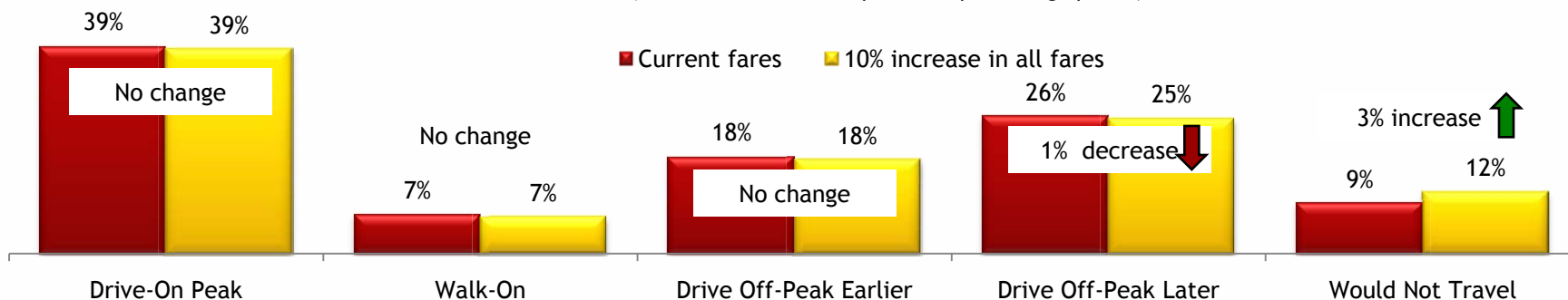


Simulator Result: 10% Across the Board Increase by Trip Purpose

- ❖ There is no real impact on shifting peak vehicle volumes to walk-on or off-peak drive-on with a 10% across the board increase for either discretionary or non-discretionary peak vehicle drivers.
- ❖ Potentially more discretionary peak vehicle drivers may elect to not use the ferry compared to their non-discretionary counterparts (3 vs. 1 percentage point increase respectively).

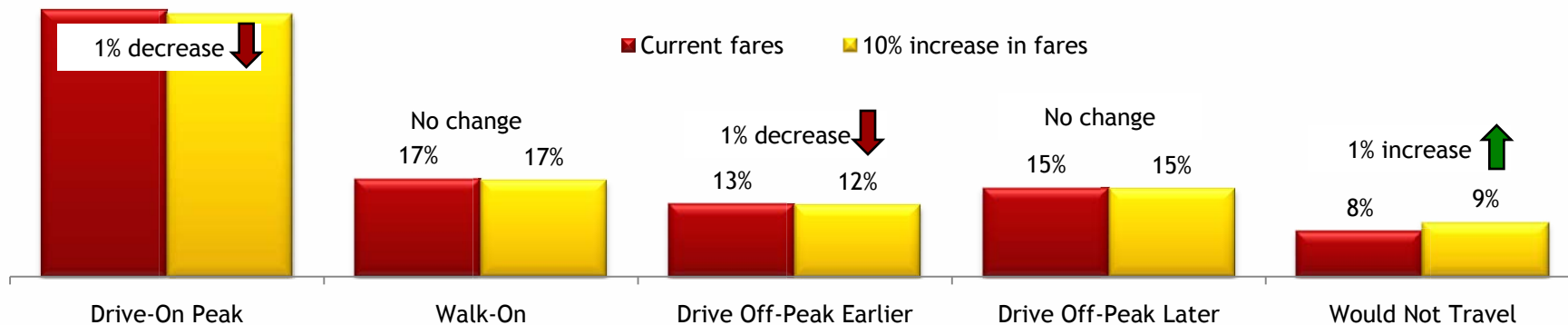
Discretionary: 10% Across the Board Increase

(increases/decreases reported in percentage points)



Non-Discretionary: 10% Across the Board Increase

(increases/decreases reported in percentage points)



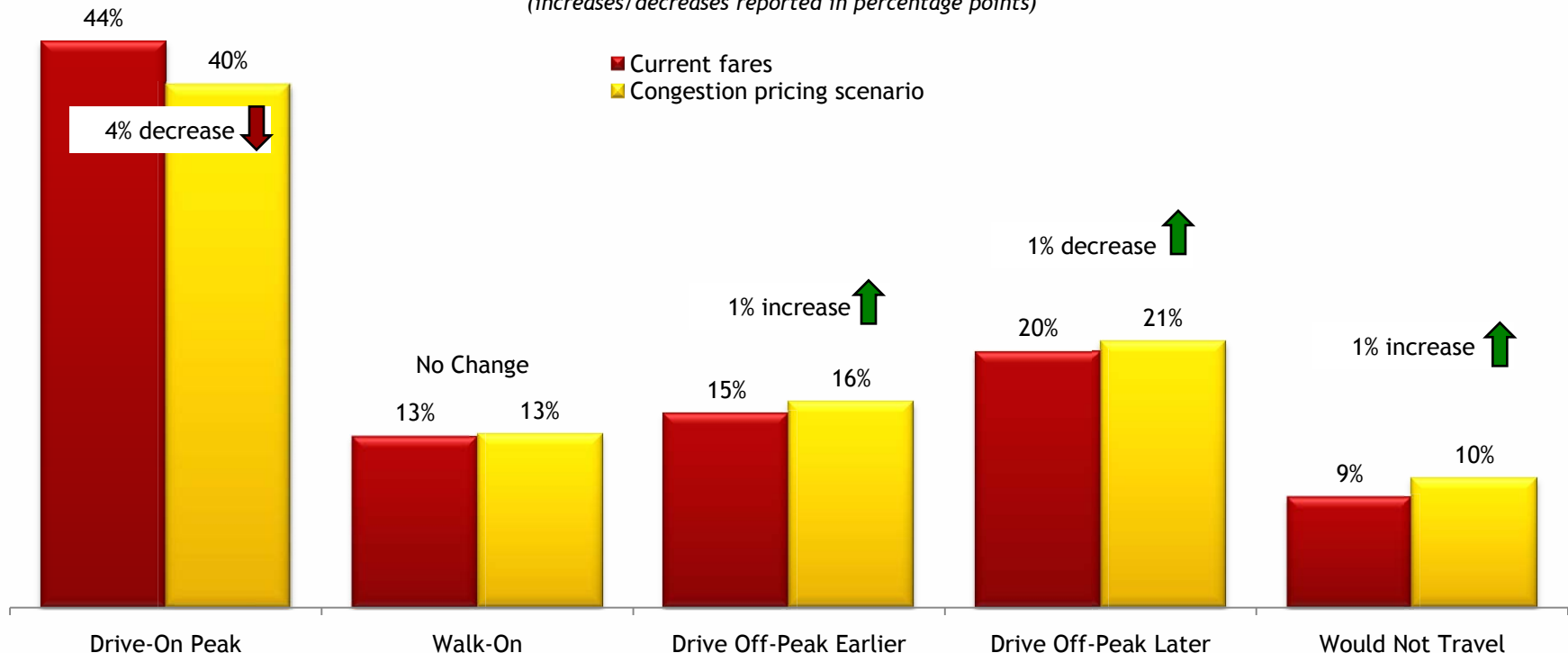


Simulator Result: 15% Peak Vehicle Fare Increase Coupled with a 5% Increase in Walk-on & Off-Peak Vehicle Fares

- ❖ This simulation shows the results of one congestion pricing option where peak vehicle fares are increased by 15% coupled with a 5% increase in walk-on fares (both peak and off peak) and a 5% increase in off-peak vehicle fares.
- ❖ Under this congestion pricing scenario, vehicle traffic at peak times would decline by 4 percentage points.
- ❖ There would be a 2 percentage point increase in off-peak vehicle travel under this congestion pricing scenario.
- ❖ This scenario would only see a 1 percentage point increase in the “would not travel” behavior.

TOTAL: 15% Peak Drive-on Increase/5% Off-Peak/Walk-on Increase

(increases/decreases reported in percentage points)



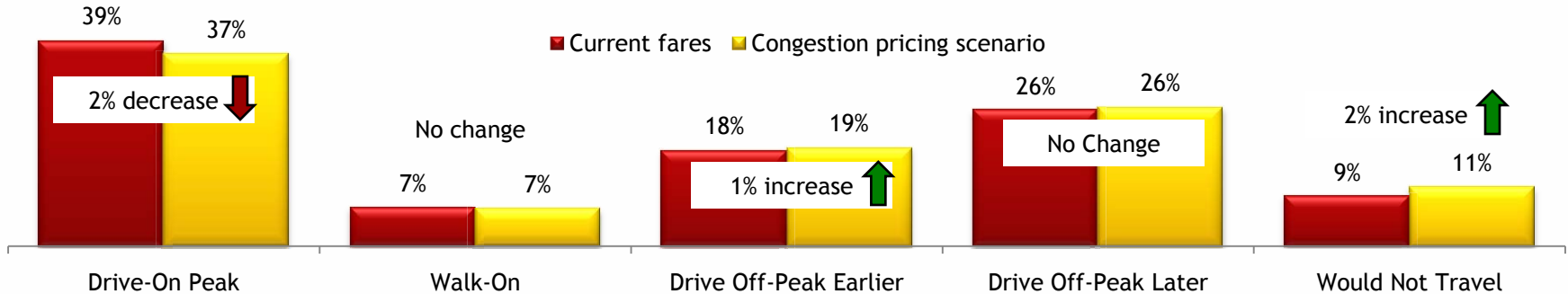


Simulator Result: 15% Peak Vehicle Fare Increase Coupled with a 5% Increase in Walk-on & Off-Peak Vehicle Fares by Trip Purpose

- ❖ Under this congestion pricing scenario, there is a greater decline in non-discretionary vehicle traffic versus their discretionary counterpart (4 vs. 2 percentage point decline).
- ❖ This congestion pricing scenario would only produce a 1 or 2 percentage point increase in “would not travel” behavior.

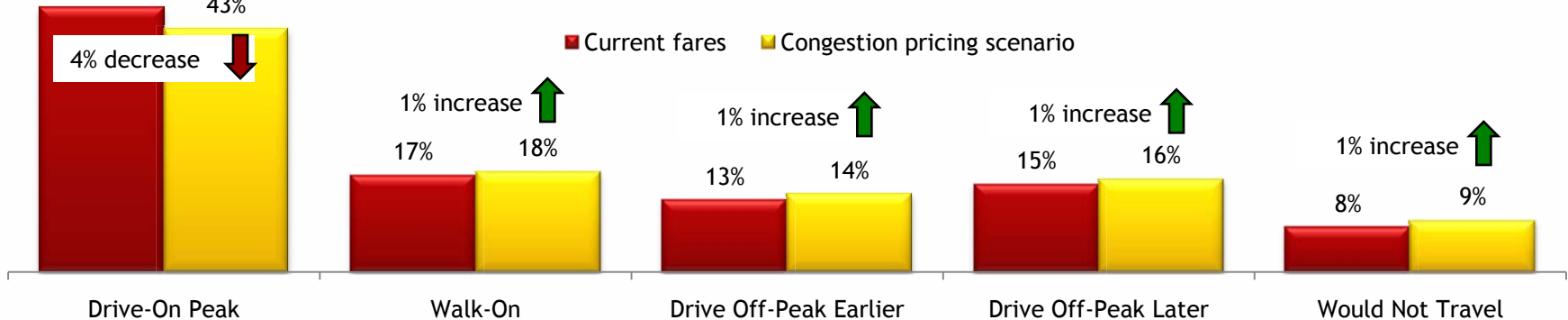
Discretionary: 15% Peak Drive-on Increase/5% Off-Peak/Walk-on Increase

(increases/decreases reported in percentage points)



Non-Discretionary: 15% Peak Drive-on Increase/5% Off Peak/Walk-on Increase

(increases/decreases reported in percentage points)





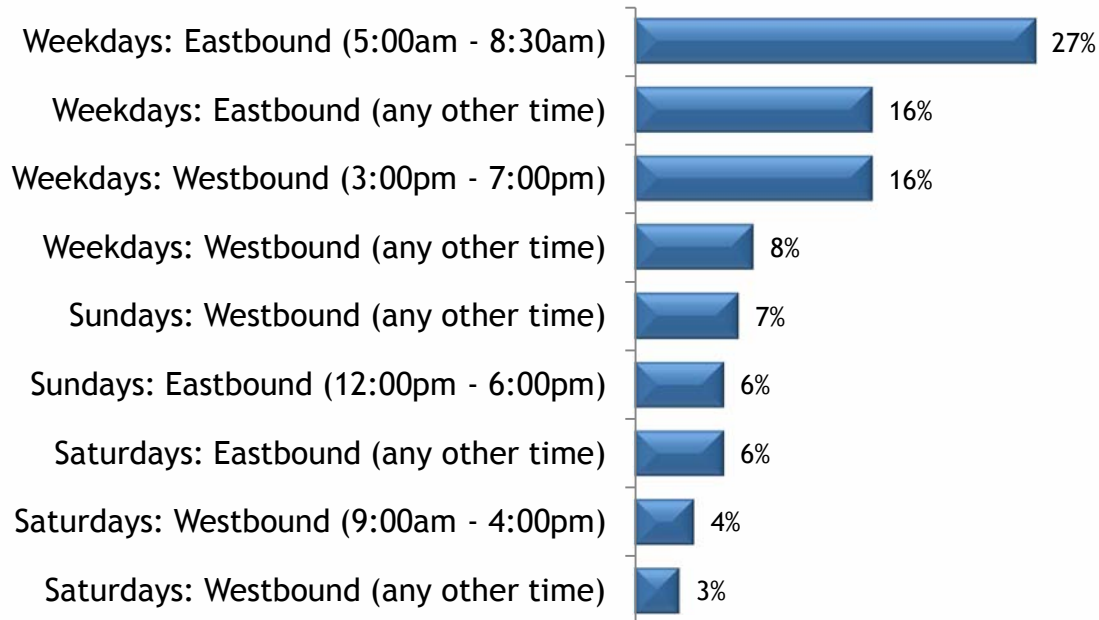
Most Recent *Drive-On Peak Period Trip*



Peak Vehicle Drivers: Time and Direction of Travel

- ❖ Among peak vehicle drivers, the most commonly mentioned day and direction for their last peak vehicle trip are **weekdays eastbound** and **weekday evenings westbound**.
 - Given that most respondents would complete the survey at home on the Westside of Puget Sound, it is interesting that the largest percentages for last peak vehicle trip comes from an Eastbound weekday instead of Westbound weekday. This would suggest that the peak vehicle volumes are more concentrated in the morning hours and spread out over both peak and off peak for the return trips.

Time and Direction of Last Peak Vehicle Trip
(n=1,317 - peak vehicle drivers)



Q1 Thinking of the last time you drove on to a ferry as a driver, in which of these directions and time periods did your trip start?

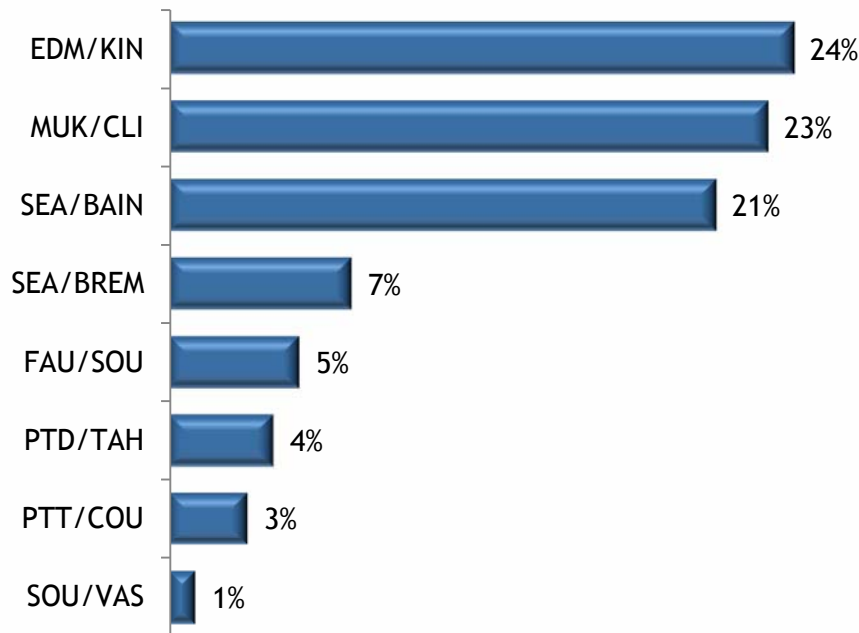


Peak Vehicle Drivers: Route/Day of Last Trip

- ❖ The most often mentioned route for their last peak vehicle trip is Edmonds/Kingston (24%) and Mukilteo/Clinton (23%) and Seattle Bainbridge (21%).
- ❖ Among peak vehicle drivers, the most recent peak trip occurred on either Tuesdays, Fridays or Thursdays.
 - No significant overarching trends are found between peak vehicle drivers of different routes and the day of their most recent ferry trip.

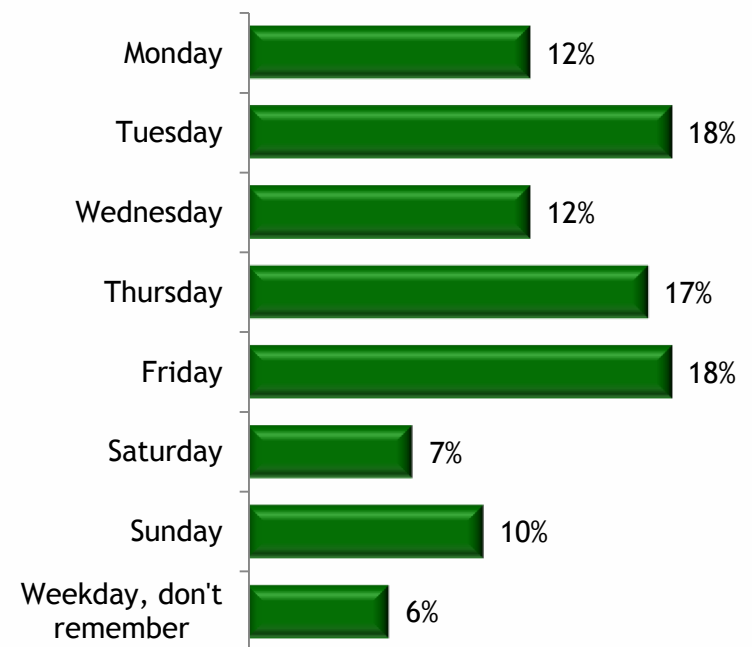
Last Route Taken

(n=1,317 - peak time drivers)



Day of Last Trip

(n=1,317 - peak time drivers)



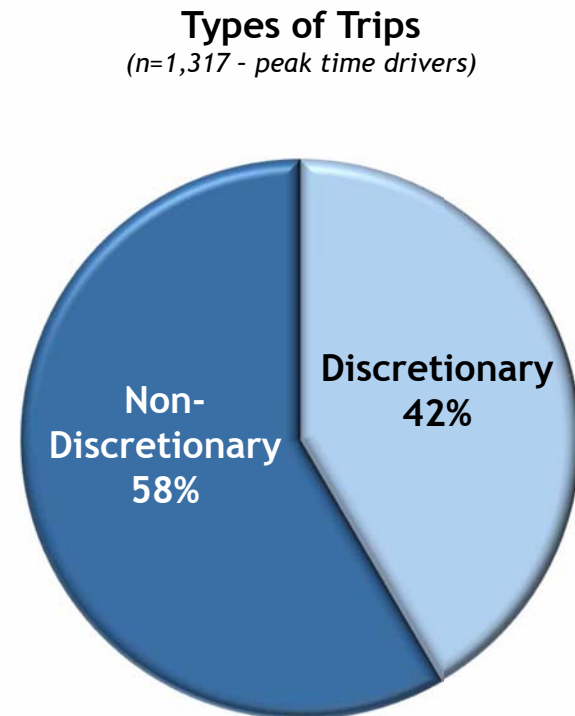
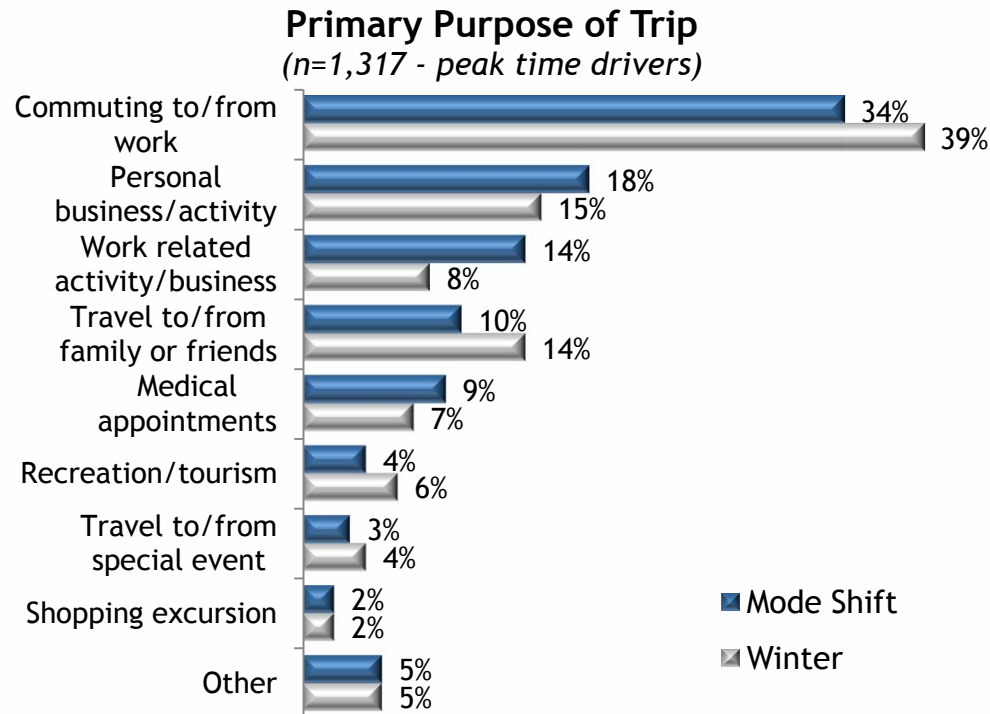
Q2 What route did you take for your last <Q1> trip?

Q2A What day of the week was your last <Q1> trip?



Peak Vehicle Drivers: Trip Purpose Specific

- ❖ One third of peak hour drivers indicate **commuting to/from work** as the primary purpose of their last ferry trip.
 - Special event and shopping excursion travel accounted for only 5% of total responses.
 - Over half of Fauntleroy/Southworth riders report the purpose of **commuting to/from work**, while 21% of Port Townsend/Coupeville riders indicate traveling for **tourism/recreation**, both significantly more than riders of other routes.



Q4 What was your primary purpose for the trip described above?



Peak Vehicle Drivers: Trip Purpose General

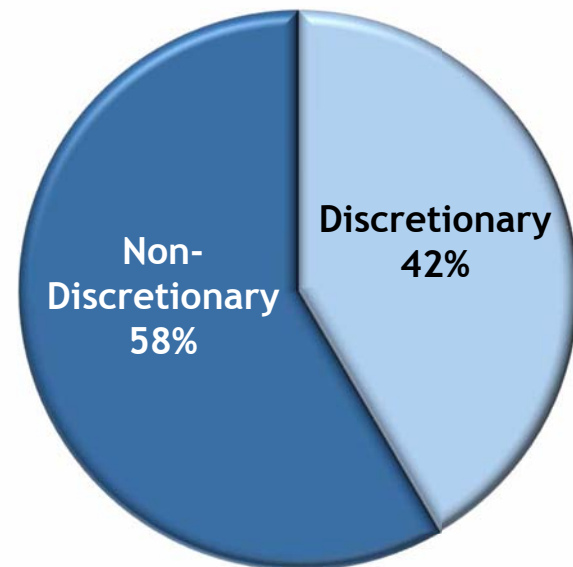
❖ **Discretionary trips** are made up of the following specific trip purposes:

- Personal business/activities
- Travel to/from family/friends
- Tourism/recreational
- Travel to/from special events
- Shopping Excursions
- Travel to/from vacation home/property
- Multiple reasons/combined trips

❖ **Non-Discretionary trips** are made up of the following specific trip purposes:

- Commuting to and from work
- Work related activities/business
- Medical appointments
- Commuting to and from school
- Commuting to and from the airport

Types of Trips
(n=1,317 - peak time drivers)



Q4 What was your primary purpose for the trip described above?



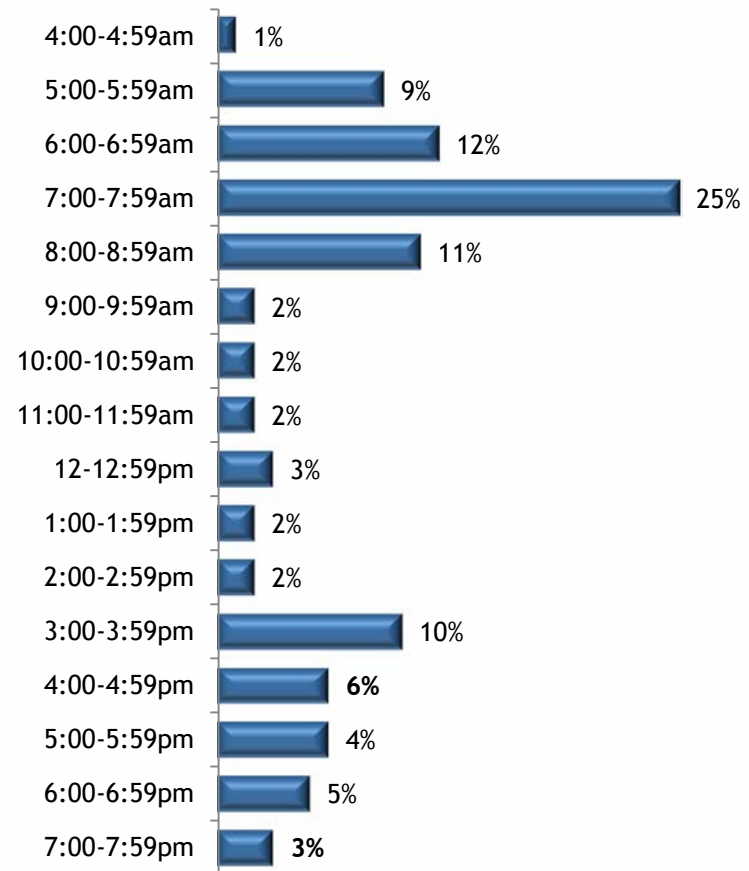
Peak Vehicle Drivers: Departure Time

❖ The chart to the right clearly depicts the surge in ferry ridership during peak travel periods (both morning and evening increases).

- One quarter of peak vehicle drivers last traveled on a ferry scheduled between 7:00-7:59am.
- Nearly half of all peak vehicle drivers departed during the times of 6:00-7:59am.
- Another twenty percent of peak vehicle drivers departed during the hours of 3:00-5:59pm.

❖ The uniqueness of the Port Townsend / Coupeville route (peak travel period is considerable longer) can be seen in that peak vehicle drivers on that route tend to be significantly more likely than peak vehicle drivers of other routes to travel between 12:00-2:59pm.

Scheduled Departure Time
(n=1,317 - peak time drivers)



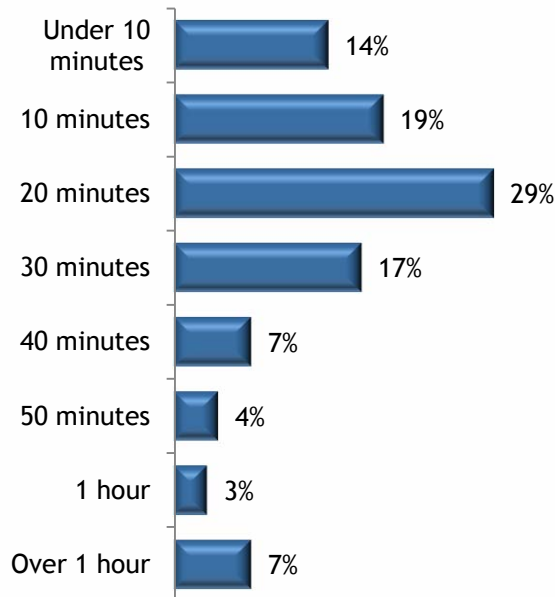
Q5 What was the scheduled departure time of the ferry you were on for this trip?



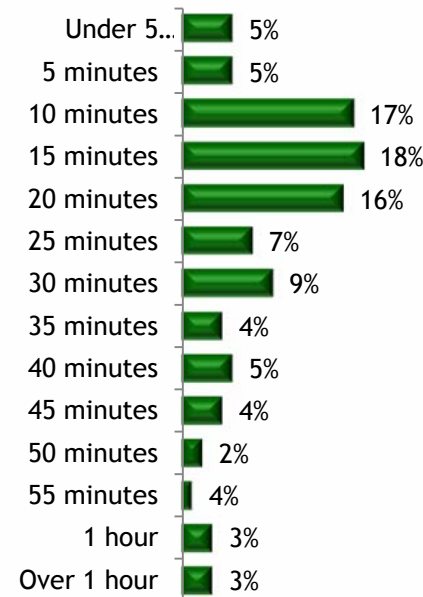
Peak Vehicle Drivers: Travel Time & Wait Time

- ❖ Half of all peak vehicle drivers spent between 10-20 minutes traveling to the ferry terminal prior to departure, and then waited an additional 10-20 minutes to board the ferry.
 - Those on the Port Townsend/Coupeville and Edmonds/Kingston routes tend to report a higher average travel time than others to the terminal (51 minutes and 34 minutes, respectively).
 - Port Townsend/Coupeville riders also indicate an average wait time (38 minutes) that is significantly higher than all other routes.

Travel Time to Ferry Terminal
(n=1,317)



Wait Time Before Boarding
(n=1,317)



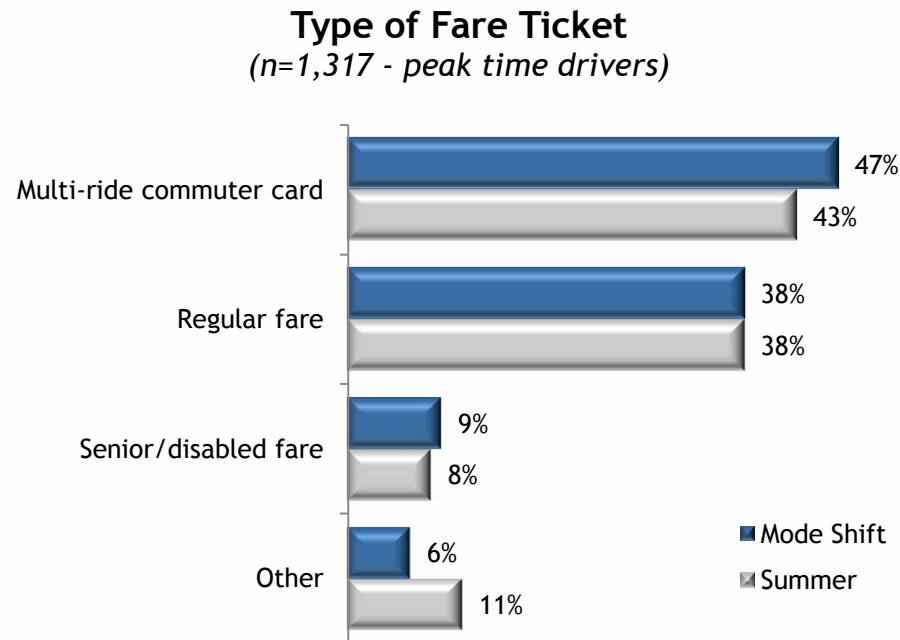
Q6 About how many minutes did it take to drive to the ferry terminal at the time of day you made this trip?

Q7 After you reached the terminal, about how long did you have to wait before getting on a boat?



Peak Vehicle Drivers: Ticket Type

- ❖ Nearly half of all on peak vehicle drivers purchased a **multi-ride commuter card** for their most recent trip.
 - Sixty percent or more of peak vehicle drivers report purchasing a multi-ride commuter card on the Port Defiance/Tahlequah, Fauntleroy/Vashon and Mukilteo/Clinton routes, significantly more than found on other routes.
 - Those on the Port Townsend/Coupeville route tend to be significantly more likely to purchase regular fare (60%) and senior/disabled fare (31%) tickets.



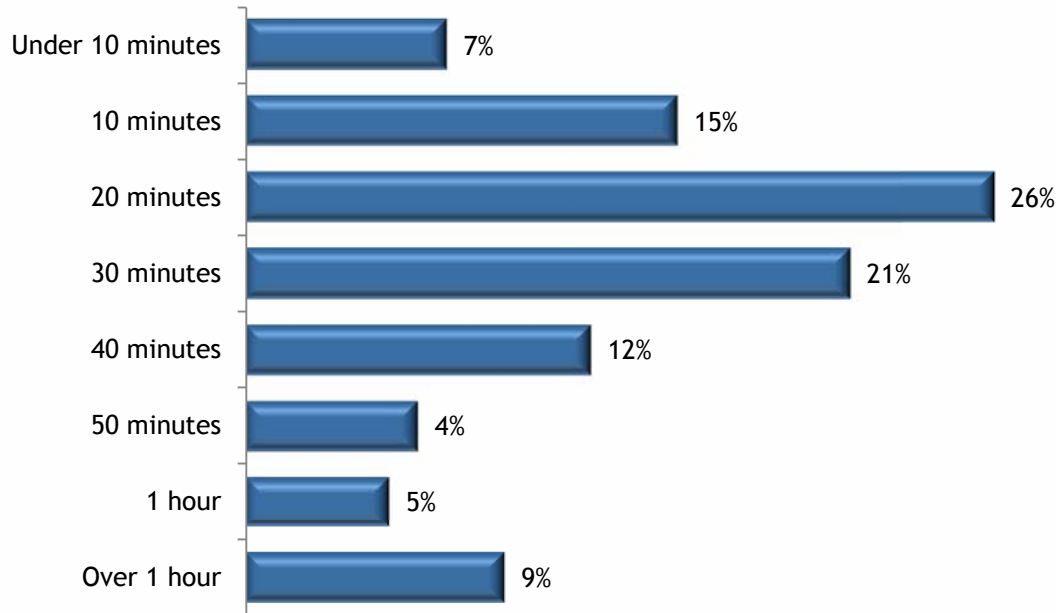
Q8 What type of fare ticket did you purchase for this trip?



Peak Vehicle Drivers: Travel Time to Destination

- ❖ Nearly half of peak vehicle drivers drove for an additional 20-30 minutes from the ferry terminal **to their final destination**, while 14% traveled for one hour or more.
 - Peak vehicle drivers on the Port Townsend/Coupeville route report a significantly longer average travel time (56 minutes) to reach their destination than found on all other routes.

Travel Time to Final Destination
(n=1,317 - peak time drivers)



Q9 After you departed the ferry about how many minutes did it take to drive from the ferry terminal to your final destination at the time of day you made this trip?



Peak Vehicle Drivers: Travel Time & Wait Time by Routes

- ❖ Port Townsend/Coupeville peak vehicle drivers have the longest average travel time - they spend approximately one hour driving to the terminal and another hour from the terminal to their final destination and 37.6 minutes waiting for the ferry.
- ❖ Seattle/Bremerton peak vehicle drivers have the shortest total travel time (excluding sailing time).

Average Minutes <i>Sample size</i>	Total <i>1314</i>	Sea / Bain <i>276</i>	Sea / Brem <i>95</i>	Pdef / Tahl <i>53</i>	Edm/ King <i>313</i>	Faun / Vas <i>157</i>	Faun / Sth <i>69</i>	Sth / Vas <i>14</i>	Ptt / Coup <i>37</i>	Muk / Clin <i>303</i>
Travel time to Terminal	25.4	22.2	20.2	23.3	34.1	19.7	16.8	27.4	51.1	22.9
Wait at terminal	24.0	24.6	18.4	16.0	26.5	20.4	23.9	16.3	37.6	24.7
Travel time from terminal to final destination	32.0	27.3	20.7	30.0	38.8	27.9	24.0	20.0	55.7	34.7
TOTAL	81.4	74.1	59.3	69.3	99.4	68.0	64.7	63.7	144.4	82.3

Q6 About how many minutes did it take to drive to the ferry terminal at the time of day you made this trip?

Q7 After you reached the terminal, about how long did you have to wait before getting on a boat?

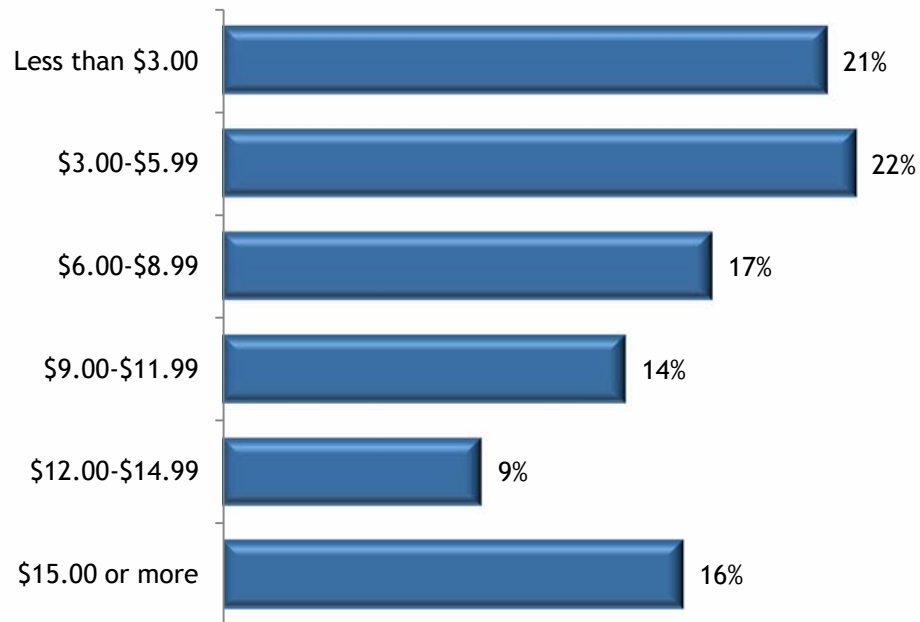
Q9 After you departed the ferry about how many minutes did it take to drive from the ferry terminal to your final destination at the time of day you made this trip?



Peak Vehicle Drivers: Other Travel Costs

- ❖ One third of peak vehicle drivers report spending between \$3.00-\$5.99 on additional travel expenses, including gas, parking and other costs besides the ferry fare.

Spending for Additional Travel Costs
(n=1,317)



	Sample size	Median \$ Spent
Total	1317	\$6.00
Sea / Bain	276	\$6.50
Sea / Brem	95	\$6.00
Pdef / Tahl	53	\$6.00
Edm/ King	313	\$7.50
Faun / Vas	157	\$5.00
Faun / Sth	69	\$5.00
Sth / Vas	14	\$7.50
Ptt / Coup	37	\$10.00
Muk / Clin	303	\$5.00

- Q11 Beyond your ferry fare <fare\$> what would you estimate you spend in gas, parking, and other costs getting from your starting point to your final destination?
- Q12 Given that the driving portion of your trip takes approximately <duration> minutes, does <Q11> seem reasonable to cover gas, parking, and other costs associated with getting to your final destination?
- Q12A What would you estimate it would cost for gas, parking and other expenses to get from your starting point to your final destination?



Appendix A: Scenario-by-Scenario Selections

The 12 scenarios used as the basis for the conjoint are shown on the following pages. On each page you see the concept and the graph to the right shows the percent of people choosing each option.



Choice-Based Conjoint Scenario Summary

- ❖ Whole count results from the choice-based conjoint exercise find:
 - Driving on before or after the peak period is the most selected option, selected at least once by 51% of the respondents.
 - 27% chose driving on after the peak in at least one scenario.
 - 23% chose driving on before the peak.
 - 11% selected both among their 12 choices.
 - 16% selected only an after or before peak drive-on (9% after peak, 7% before peak).
 - 27% chose the walk-on option at least once.
 - Only 1% selected the walk-on option in all 12 scenarios.
 - 20% said they would not use the ferries in at least one of the 12 scenarios.
 - Only 4% selected the “won’t take ferry” option in all 12 scenarios.
 - 43% chose the option of driving on during a peak period at least once.

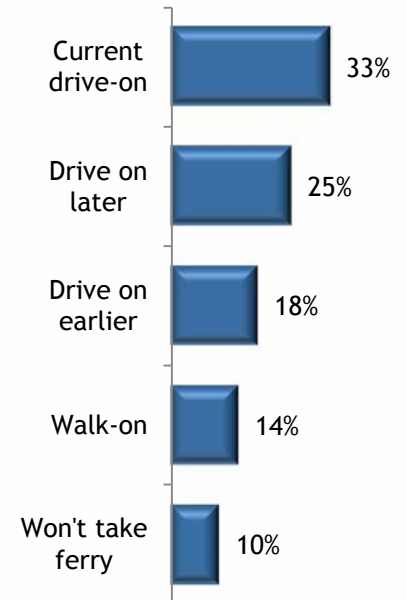


Scenario #1

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 1 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON (at peak)	WALK-ON (at peak)	DRIVE ON EARLIER (off peak)	DRIVE ON LATER (off peak)	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Dropped off at terminal	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$4	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	One sailing earlier than Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + one sailing	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare +10%	Current passenger fare +5%	Current vehicle fare 0%	Current vehicle fare -10%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min.	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + parking costs + $Q11 \cdot (Q9 / (Q6 + Q9))$	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #1 Travel Selection (n=1,317)



Q01 If scenario #1 were the only travel options available when you were making your previous <Q1 direction> <Q2route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?

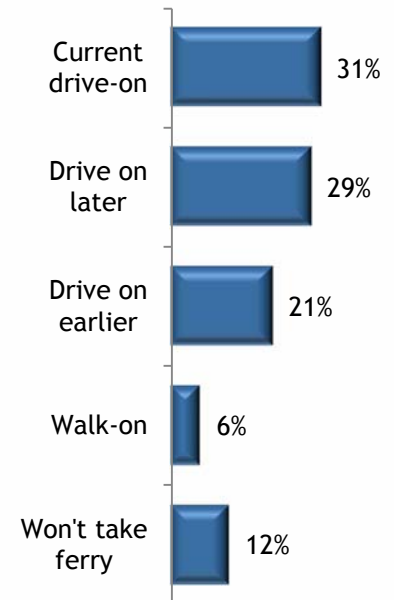


Scenario #2

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 2 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$4/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$8	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	=Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + two sailings	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare +15%	Current passenger fare 0%	Current vehicle fare -5%	Current vehicle fare -15%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min.	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + parking costs + Q11	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #2 Travel Selection (n=1,317)



Q01 If scenario #2 were the only travel options available when you were making your previous <Q1 direction> <Q2route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?

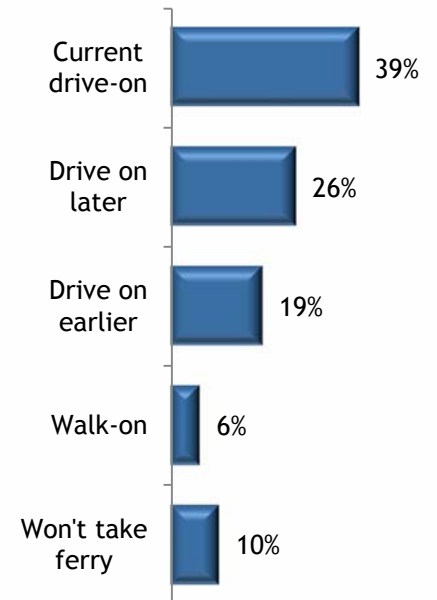


Scenario #3

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 3 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$8/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Shuttle to transit center	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	One sailing earlier than Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare +20%	Current passenger fare - 5%	Current vehicle fare -10%	Current vehicle fare -20%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min. + Q9	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + \$1.50 + parking costs + Q11*(Q6/(Q6+Q9))	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #3 Travel Selection (n=1,317)



Q01 If scenario #3 were the only travel options available when you were making your previous <Q1 direction> <Q2route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?

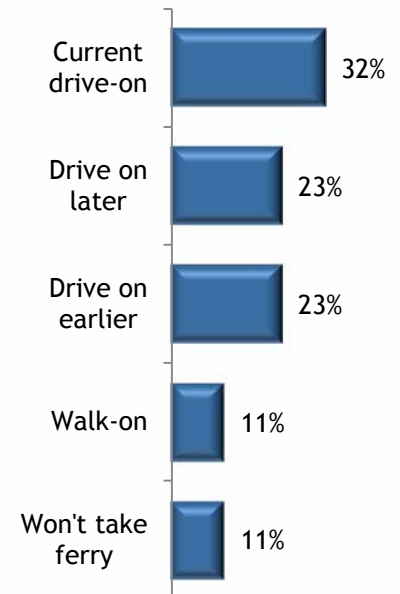


Scenario #4

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 4 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Park free & ride transit	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$4	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	Two sailings earlier than Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + one sailing	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare +25%	Current passenger fare -10%	Current vehicle fare -15%	Current vehicle fare + 5%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min. + Q6*0.25	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + \$1.50 + parking costs + Q11*(Q9/(Q6+Q9))	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #4 Travel Selection (n=1,317)



Q01 If scenario #4 were the only travel options available when you were making your previous <Q1 direction> <Q2route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?

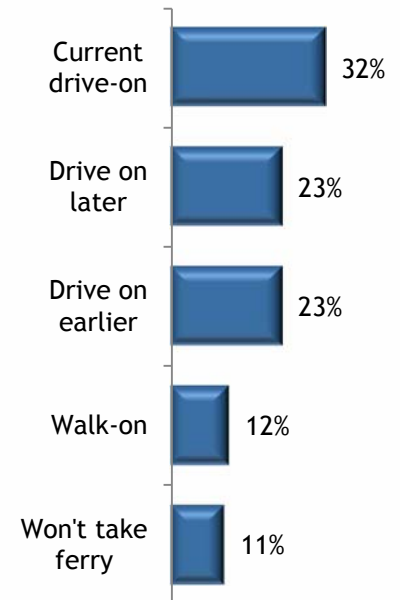


Scenario #5

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 5 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Dropped off at terminal	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$8	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	=Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + two sailings	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare 0%	Current passenger fare -15%	Current vehicle fare -20%	Current vehicle fare 0%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min.	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + parking costs + Q11*(Q9/(Q6+Q9))	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #5 Travel Selection (n=1,317)



Q01 If scenario #5 were the only travel options available when you were making your previous <Q1 direction> <Q2route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?

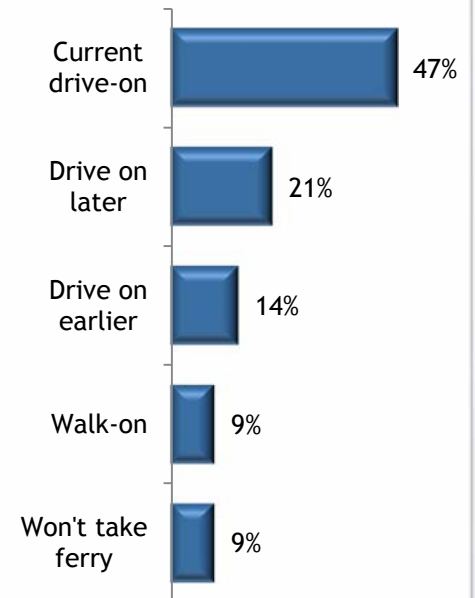


Scenario #6

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 6 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$4/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Shuttle to transit center	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	Two sailings earlier than Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare +5%	Current passenger fare -20%	Current vehicle fare + 5%	Current vehicle fare -5%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min. + Q9	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + \$1.50 + parking costs + Q11*(Q6/(Q6+Q9))	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #6 Travel Selection (n=1,317)



Q01 If scenario #6 were the only travel options available when you were making your previous <Q1 direction> <Q2route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?

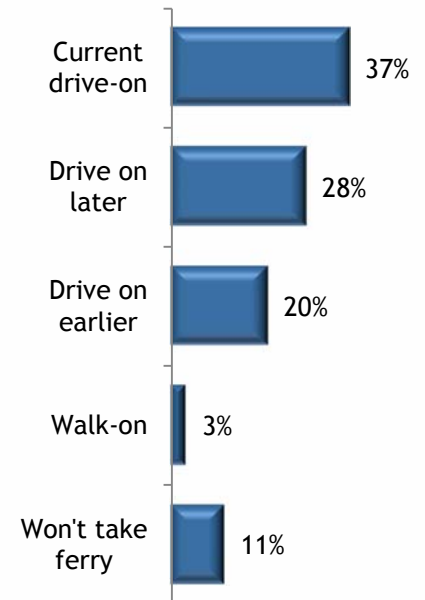


Scenario #7

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 7 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$8/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$4	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	=Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + one sailing	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare +10%	Current passenger fare +5%	Current vehicle fare 0%	Current vehicle fare -10%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min.	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + parking costs + Q11	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #7 Travel Selection (n=1,317)



Q01 If scenario #7 were the only travel options available when you were making your previous <Q1 direction> <Q2route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?

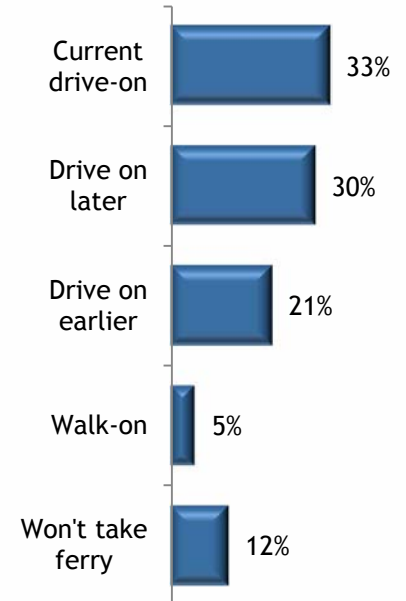


Scenario #8

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 8 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Park free & ride transit	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$8	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	Two sailings earlier than Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + two sailings	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare +15%	Current passenger fare 0%	Current vehicle fare -5%	Current vehicle fare -15%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min. + Q6*0.25	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + \$1.50 + parking costs + Q11	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #8 Travel Selection (n=1,317)



Q01 If scenario #8 were the only travel options available when you were making your previous <Q1 direction> <Q2route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?

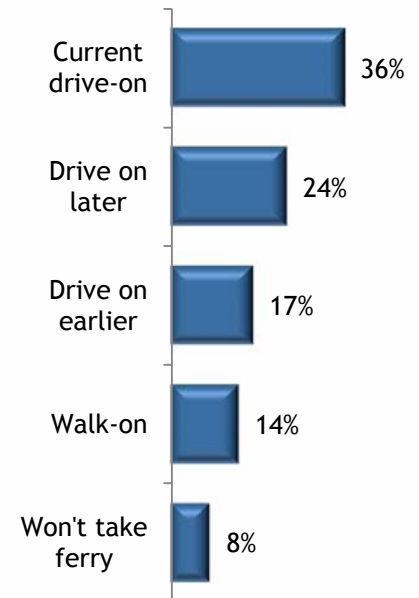


Scenario #9

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 9 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Dropped off at terminal	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Shuttle to transit center	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	One sailing earlier than Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare +20%	Current passenger fare - 5%	Current vehicle fare -10%	Current vehicle fare -20%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min. + Q9	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + \$1.50 + parking costs	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #9 Travel Selection (n=1,317)



Q01 If scenario #9 were the only travel options available when you were making your previous <Q1 direction> <Q2route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?

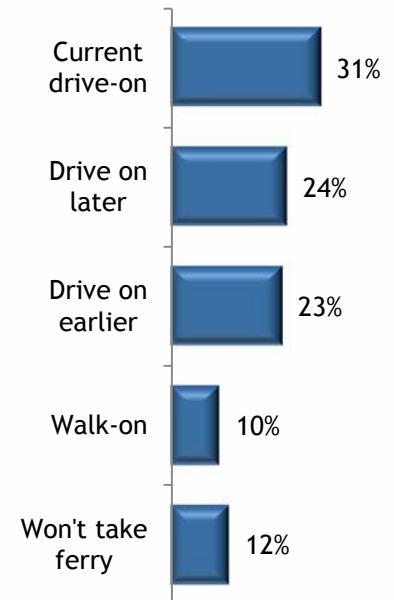


Scenario #10

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 10 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$4/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$4	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	=Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + one sailing	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare +25%	Current passenger fare -10%	Current vehicle fare -15%	Current vehicle fare +5%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min.	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + parking costs + Q11	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #10 Travel Selection (n=1,317)



Q01 If scenario #10 were the only travel options available when you were making your previous <Q1 direction> <Q2route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?

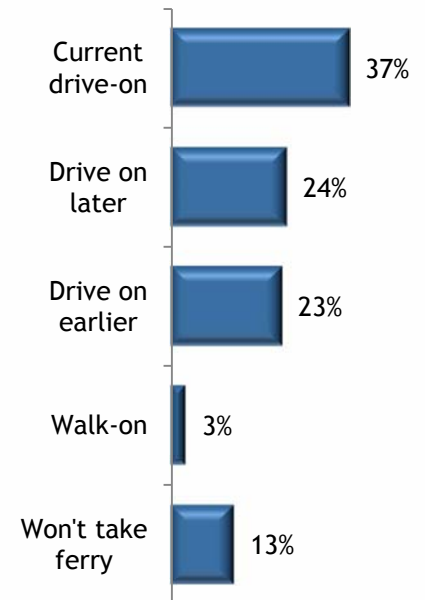


Scenario #11

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 11 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$8/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$8	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	=Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + two sailings	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare + 0%	Current passenger fare - 15%	Current vehicle fare - 20%	Current vehicle fare + 0%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min.	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + parking costs + Q11	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #11 Travel Selection (n=1,317)



Q01 If scenario #11 were the only travel options available when you were making your previous <Q1 direction> <Q2 route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?

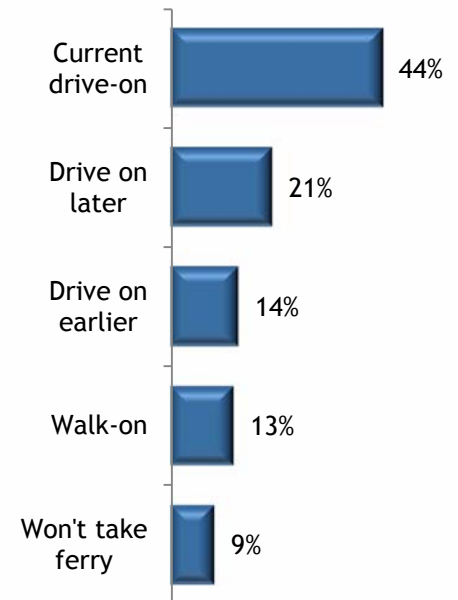


Scenario #12

The graph to the right shows the percent of riders that selected each Major Travel Option in this scenario.

Scenario 12 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Park free & ride transit	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Shuttle to transit center	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q5 response	Two sailings earlier than Q5 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare + 5%	Current passenger fare - 20%	Current vehicle fare + 5%	Current vehicle fare - 5%	
TOTAL TRAVEL TIME	(Q10) min. + addt'l wait time	(Q10) min. + Q6*0.25 + Q9	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + addt'l fare	Walk on fare + \$3.00 + parking costs	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario #12 Travel Selection (n=1,317)



Q01 If scenario #12 were the only travel options available when you were making your previous <Q1 direction> <Q2route> trip for the purpose of <Q4 purpose>, which option would you have most likely chosen?



Appendix B: Weighting Scheme



Weighting Scheme

	SYSTEM VOLUME - n	SYSTEM VOLUME - proportion	SAMPLE - n	SAMPLE - proportion	WEIGHT
SEA/BAIN	1,000,554	0.209354	254	0.192863	1.085508
SEA/BRE	343,395	0.071851	123	0.093394	0.769334
PTD/TAH	193,222	0.040429	21	0.015945	2.535499
EDM/KIN	1,136,554	0.237810	249	0.189066	1.257815
FAU/VAS	569,740	0.119211	151	0.114655	1.039743
FAU/SOU	250,631	0.052442	90	0.068337	0.767394
SOU/VAS	51,380	0.010751	19	0.014427	0.745189
PTT/KEY	135,475	0.028347	84	0.063781	0.444433
MUK/CLI	1,098,298	0.229806	326	0.247532	0.928386
TOTAL	4,779,249		1,317		



Appendix C - Peak Hours



Peak Hours - Weekdays

WEEKDAYS	
<i>AM times in blue -- PM times in red</i>	
AM Eastbound	PM Westbound
Leave Bainbridge	Leave Seattle
5:20 AM	3:00 PM
6:20 AM	3:45 PM
7:05 AM	4:40 PM
7:55 AM	5:30 PM
	6:20 PM
Leave Bremerton	Leave Seattle
4:50 AM	3:00 PM
6:20 AM	4:20 PM
7:20 AM	5:30 PM
	6:45 PM
Leave Clinton	Leave Mukilteo
5:10 AM	3:00 PM
5:30 AM	3:30 PM
6:00 AM	4:00 PM
6:30 AM	4:30 PM
7:00 AM	5:00 PM
7:30 AM	5:30 PM
8:00 AM	6:00 PM
8:30 AM	6:30 PM
	7:00 PM
Leave Kingston	Leave Edmonds
5:35 AM	3:15 PM
6:25 AM	3:55 PM
7:05 AM	4:45 PM
7:55 AM	5:25 PM
	6:15 PM
	7:00 PM

WEEKDAYS	
<i>AM times in blue -- PM times in red</i>	
Leave Port Townsend	Leave Keystone
6:30 AM	12:00 PM
8:00 AM	1:30 PM
11:20 AM	3:00 PM
12:45 PM	4:30 PM
2:15 PM	6:00 PM
3:45 PM	
5:15 PM	
Leave Talequah	Leave Point Defiance
5:30 AM	3:40 PM
6:20 AM	4:35 PM
7:10 AM	5:30 PM
8:00 AM	6:30 PM
Leave Southworth	Leave Fauntleroy
5:00 AM	3:05 PM
6:05 AM	3:35 PM
6:40 AM	4:20 PM
7:55 AM	5:00 PM
8:20 AM	5:40 PM
	6:30 PM
Leave Vashon	Leave Fauntleroy
5:20 AM	3:05 PM
5:45 AM	4:00 PM
6:20 AM	4:40 PM
6:40 AM	5:00 PM
7:00 AM	5:40 PM
7:15 AM	6:00 PM
7:55 AM	6:30 PM
8:15 AM	

WEEKDAYS	
<i>AM times in blue -- PM times in red</i>	
Leave Southworth	Leave Vashon
5:00 AM	3:30 PM
6:05 AM	5:25 PM
6:40 AM	6:05 PM
7:55 AM	7:00 PM
8:20 AM	
Leave San Juans	Leave Anacortes
5:55 AM	3:00 PM
6:10 AM	4:00 PM
6:40 AM	5:15 PM
6:55 AM	6:00 PM
7:00 AM	
7:15 AM	
7:40 AM	
8:05 AM	
8:25 AM	
Leave Anacortes	Leave Sidney
8:25 AM	11:35 AM
2:20 PM	5:55 PM



Peak Hours - Weekends

<i>AM times in blue -- PM times in red</i>	
Sunday Eastbound	Saturday Westbound
Leave Bainbridge	Leave Seattle
12:20 PM	9:35 AM
1:10 PM	10:35 AM
2:05 PM	11:25 AM
2:55 PM	12:20 PM
3:50 PM	1:10 PM
4:35 PM	2:05 PM
5:30 PM	3:00 PM
	3:45 PM
Leave Bremerton	Leave Seattle
12:20 PM	10:00 AM
1:45 PM	11:10 AM
3:00 PM	12:35 PM
4:15 PM	1:00 PM
5:30 PM	3:00 PM
Leave Clinton	Leave Mukilteo
12:00 PM	9:00 AM
12:30 PM	9:30 AM
1:00 PM	10:00 AM
1:30 PM	10:30 AM
2:00 PM	11:00 AM
2:30 PM	11:30 AM
3:00 PM	12:00 PM
3:30 PM	12:30 PM
4:00 PM	1:00 PM
4:30 PM	1:30 PM
5:00 PM	2:00 PM
5:30 PM	2:30 PM
6:00 PM	3:00 PM
	3:30 PM
	4:00 PM

<i>AM times in blue -- PM times in red</i>	
Sunday Eastbound	Saturday Westbound
Leave Kingston	Leave Edmonds
11:55 AM	9:40 AM
12:55 PM	10:30 AM
1:30 PM	11:10 AM
2:30 PM	12:10 PM
3:10 PM	12:40 PM
4:00 PM	1:40 PM
4:40 PM	2:25 PM
5:35 PM	3:15 PM
6:10 PM	3:55 PM
Leave Port Townsend	Leave Keystone
12:45 PM	10:15 AM
2:15 PM	12:00 PM
3:45 PM	3:00 PM
5:15 PM	
Leave Talequah	Leave Point Defiance
12:10 PM	9:15 AM
1:00 PM	10:05 AM
2:15 PM	10:55 AM
3:10 PM	11:45 AM
4:05 PM	12:35 PM
5:00 PM	1:50 PM
6:00 PM	2:45 PM
	3:40 PM
Leave Southworth	Leave Fauntleroy
12:30 PM	10:10 AM
1:10 PM	10:45 AM
2:25 PM	11:10 AM
3:10 PM	11:45 AM
3:50 PM	12:20 PM
4:50 PM	12:50 PM
	1:20 PM
	1:40 PM
	2:00 PM
	2:20 PM
	3:00 PM
	3:20 PM
	4:00 PM

<i>AM times in blue -- PM times in red</i>	
Sunday Eastbound	Saturday Westbound
Leave Vashon	Leave Fauntleroy
12:50 PM	9:15 AM
1:15 PM	10:10 AM
1:30 PM	10:45 AM
1:50 PM	11:10 AM
2:30 PM	11:45 AM
2:45 PM	12:20 PM
3:30 PM	12:50 PM
3:50 PM	1:20 PM
4:10 PM	1:40 PM
4:45 PM	2:00 PM
5:10 PM	2:20 PM
5:35 PM	3:00 PM
	3:20 PM
	4:00 PM
Leave Southworth	Leave Vashon
12:30 PM	10:35 AM
1:10 PM	12:10 PM
2:25 PM	12:50 PM
3:10 PM	2:05 PM
3:50 PM	2:45 PM
4:50 PM	
5:30 PM	



Peak Hours - Weekends

<i>AM times in blue -- PM times in red</i>	
Sunday Eastbound	Saturday Westbound
Leave San Juans	Leave Anacortes
12:00 PM	9:00 AM
12:15 PM	9:25 AM
12:45 PM	10:15 AM
2:10 PM	12:40 PM
2:50 PM	1:15 PM
3:35 PM	1:50 PM
3:50 PM	3:20 PM
4:20 PM	
4:30 PM	
5:25 PM	
Leave Anacortes	Leave Sidney
8:25 AM	11:35 AM
2:20 PM	5:55 PM



First Sailing Before & After Peak

FIRST SAILINGS BEFORE & AFTER PEAK			
WEEKDAYS		WEEKENDS	
AM times in blue -- PM times in red			
AM Eastbound	PM Westbound	Sunday Eastbound	Saturday Westbound
Leave Bainbridge	Leave Seattle	Leave Bainbridge	Leave Seattle
4:45 AM	2:05 PM	11:30 AM	8:45 AM
8:45 AM	7:20 PM	6:30 PM	4:40 PM
Leave Bremerton	Leave Seattle	Leave Bremerton	Leave Seattle
4:50 (earliest)	1:30 PM	11:10 AM	8:30 AM
8:45 AM	7:50 PM	6:40 PM	4:20 PM
Leave Clinton	Leave Mukilteo	Leave Clinton	Leave Mukilteo
4:40 AM	2:30 PM	11:30 AM	8:30 AM
9:00 AM	7:35 PM	6:30 PM	4:30 PM
Leave Kingston	Leave Edmonds	Leave Kingston	Leave Edmonds
4:55 AM	2:25 PM	11:15 AM	8:50 AM
8:40 AM	7:40 PM	7:00 PM	4:45 PM
Leave Port Townsend	Leave Keystone	Leave Port Townsend	Leave Keystone
06:30 (earliest)	10:15 AM	11:15 AM	8:45 AM
6:45 PM	7:30 PM	6:45 PM	4:30 PM
Leave Talequah	Leave Point Defiance	Leave Talequah	Leave Point Defiance
5:30 (earliest)	2:40 AM	11:20 AM	9:15 AM
8:50 AM	7:25 AM	7:00 AM	4:35 PM
Leave Southworth	Leave Fauntleroy	Leave Southworth	Leave Fauntleroy
4:30 AM	2:20 PM	12:00 PM	10:00 AM
9:20 AM	7:35 PM	7:10 PM	4:00 PM
Leave Vashon	Leave Fauntleroy	Leave Vashon	Leave Fauntleroy
4:50 AM	2:45 PM	12:20 PM	8:55 AM
8:40 AM	7:05 PM	6:10 PM	4:20 PM
Leave Southworth	Leave Vashon	Leave Southworth	Leave Vashon
4:30 AM (earliest)	2:05 PM	12:00 PM	9:40 AM
9:20 AM	8:00 PM	7:10 PM	3:25 PM
Leave San Juans	Leave Anacortes	Leave San Juans	Leave Anacortes
5:55 AM (earliest)	12:30 PM	10:55 AM	6:35 AM
10:55 AM	7:00 PM	6:50 PM	5:50 PM



Appendix D: Parametric Marketing's Conjoint Analysis of Mode Shift Data



Washington State Ferries Mode Shift Conjoint

Supplementary Analysis
V2 Updated January 6th 2011

WAS005-D

Background

- Market Decisions Corporation (MDC) conducted a 2010 Mode-Shift Conjoint study on behalf of the Washington State Ferries
- MDC has completed basic analysis of the results using count analysis. However some questions have arisen, and the team would like to evaluate analytic methods more comparable to previous mode-shift study waves. In particular:
 - A logit or similar choice model is needed for comparison
 - Analysis that includes all respondents is desired (Original analysis did not include inelastic responses)
- Parametric Marketing has conducted supplementary analysis of the choice results using Hierarchical Bayes methodologies similar to the previous waves

Observations on the CBC Design

- The CBC design as fielded has some significant limitations, which should be kept in mind when reviewing the results. In particular:
 - All respondents were shown the same twelve choice tasks. As the number of variables to solve for is between 22-28 (dependent on coding scheme) this is inadequate
 - The design is not balanced, and not all levels were shown against all other levels. This leaves some ambiguity in the solution, and means that solutions will not completely converge. Some 2-way effects may be problematic

Reverse Engineering the Fielded Design

- A Partial Profile CBC (with None Option) was coded to replicate the design fielded
- 28 Variables + 'NONE'
- Available in Excel format

Attribute	Level
1 Mode	1 Drive_Peak
	2 Walk
	3 Drive_OffPeak
2 Peak_Drive_Wait	1 Base
	2 Base+1
	3 Base+2
3 OffPeak_Drive_Departure	1 Before
	2 After
4 Walk_Departure	1 Base
	2 Base-1
	3 Base-2
5 Walk_Origin	1 Drop_Off
	2 Park_\$4
	3 Park_\$8
	4 Shuttle
6 Walk_Destination	1 Park_\$4
	2 Park_\$8
	3 Shuttle
7 Fare	1 Minus_20
	2 Minus_15
	3 Minus_10
	4 Minus_5
	5 Base_Price
	6 Plus_5
	7 Plus_10
	8 Plus_15
	9 Plus_20
	10 Plus_25

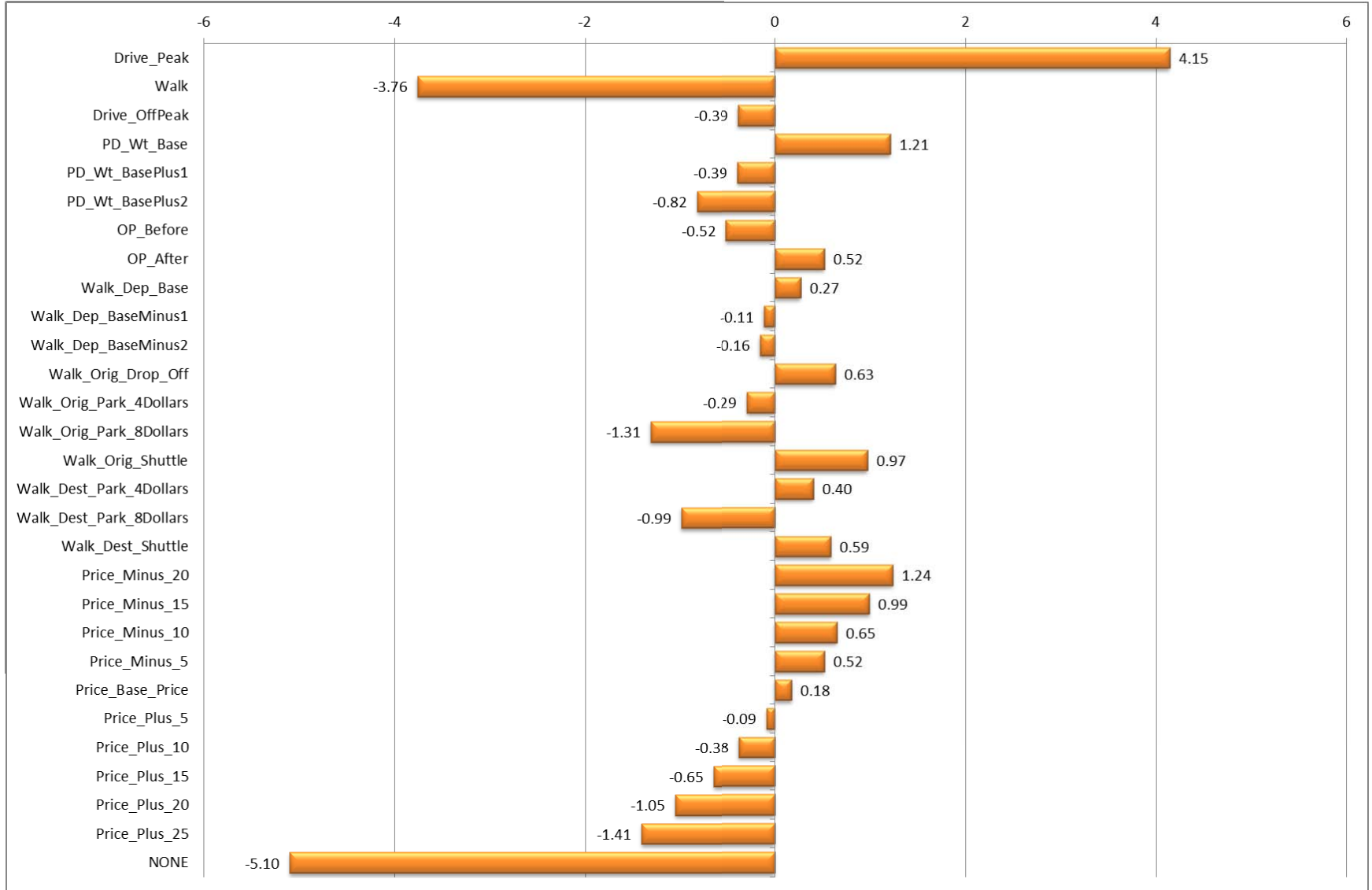
Recoded CBC Design

Task#	Concept#	Mode	Peak_Drive_Wai	OffPeak_Drive_L	Walk_Departure	Walk_Origin	Walk_Destination	Fare
1	1	1	1	2	0	0	0	7
1	2	2	2	0	0	2	1	6
1	3	3	3	0	1	0	0	5
1	4	3	3	0	2	0	0	3
1	5	0	0	0	0	0	0	0
2	1	1	3	0	0	0	0	8
2	2	2	2	0	0	1	2	5
2	3	3	3	0	1	0	0	4
2	4	3	3	0	2	0	0	2
2	5	0	0	0	0	0	0	0
3	1	1	1	0	0	0	0	9
3	2	2	2	0	0	2	3	4
3	3	3	3	0	1	0	0	3
3	4	3	3	0	2	0	0	1
3	5	0	0	0	0	0	0	0
4	1	1	2	0	0	0	0	10
4	2	2	2	0	0	3	4	3
4	3	3	3	0	1	0	0	2
4	4	3	3	0	2	0	0	6
4	5	0	0	0	0	0	0	0
5	1	1	3	0	0	0	0	5
5	2	2	2	0	0	1	1	2
5	3	3	3	0	1	0	0	1
5	4	3	3	0	2	0	0	5
5	5	0	0	0	0	0	0	0
6	1	1	1	0	0	0	0	6
6	2	2	2	0	0	3	2	1
6	3	3	3	0	1	0	0	6
6	4	3	3	0	2	0	0	4
6	5	0	0	0	0	0	0	0
7	1	1	2	0	0	0	0	7
7	2	2	2	0	0	1	3	6
7	3	3	3	0	1	0	0	5
7	4	3	3	0	2	0	0	3
7	5	0	0	0	0	0	0	0
8	1	1	3	0	0	0	0	8
8	2	2	2	0	0	3	4	5
8	3	3	3	0	1	0	0	4
8	4	3	3	0	2	0	0	2
8	5	0	0	0	0	0	0	0
9	1	1	1	0	0	0	0	9
9	2	2	2	0	0	2	1	4
9	3	3	3	0	1	0	0	3
9	4	3	3	0	2	0	0	1
9	5	0	0	0	0	0	0	0
10	1	1	2	0	0	0	0	10
10	2	2	2	0	0	1	2	3
10	3	3	3	0	1	0	0	2
10	4	3	3	0	2	0	0	6
10	5	0	0	0	0	0	0	0
11	1	1	3	0	0	0	0	5
11	2	2	2	0	0	1	3	2
11	3	3	3	0	1	0	0	1
11	4	3	3	0	2	0	0	5
11	5	0	0	0	0	0	0	0
12	1	1	1	0	0	0	0	6
12	2	2	2	0	0	3	4	1
12	3	3	3	0	1	0	0	6
12	4	3	3	0	2	0	0	4
12	5	0	0	0	0	0	0	0

Hierarchical Bayes Analysis

- Partial Profile design coded as shown
- In order to assist with stability, price monotonicity was enforced
- Route and trip type (Discretionary/Non-Discretionary) were included as covariates in the analysis
- The inadequate design means that convergence cannot occur; however, some stability of solutions was seen which allowed a **'snapshot' of utility betas to be taken in a meaningful way**
- Note: In following summaries, Raw Logit Weights have been scaled to have a mean of zero ***for each attribute***. Also, as this is a partial profile design typical **'importance' measures do not apply**

Logit Utility Summary: All Responses



Raw Utility Summary

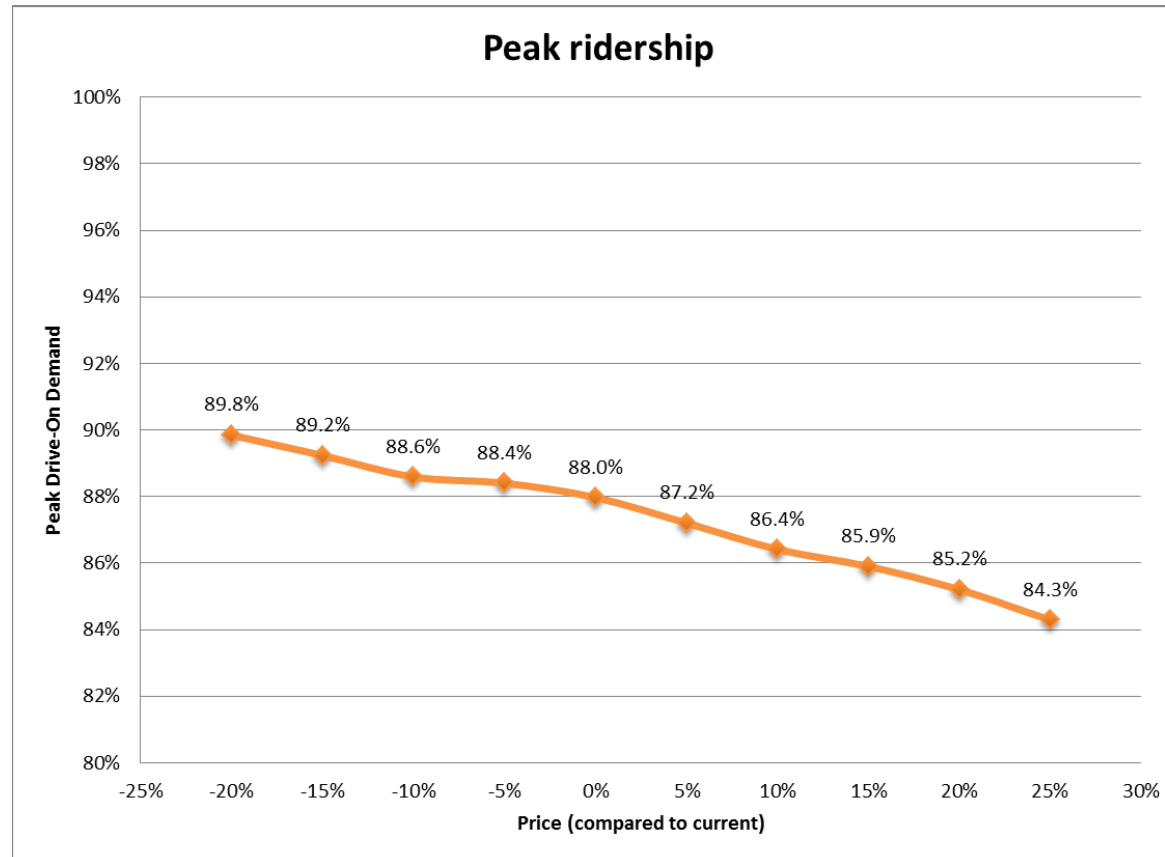
	All Respondents	Non- Discretionary	Discretionary	Seattle/Bain bridge	Seattle/Brem erton	Point Defiance/Tah lequah	Edmonds/Kin gston	Fauntleroy/V ashon	Fauntleroy/S outhworth	Southworth/ Vashon	Port Townsend/C oupeville	Mukilteo/Cli nton
Drive_Peak	4.1468	4.2754	3.961	4.077	3.6969	4.9872	3.8951	5.0694	2.9156	6.2507	5.3449	4.0198
Walk	-3.7581	-2.6658	-5.3359	-2.8804	-1.7246	-5.1719	-4.3129	-4.8572	-3.4153	-6.0374	-6.0499	-3.4893
Drive_OffPeak	-0.3887	-1.6096	1.3748	-1.1967	-1.9723	0.1847	0.4178	-0.2121	0.4998	-0.2133	0.705	-0.5305
PD_Wt_Base	1.2119	1.0112	1.5017	1.62	1.5403	0.7509	1.0071	0.6111	1.7639	0.6485	0.7396	1.3006
PD_Wt_BasePlus1	-0.3923	-0.1553	-0.7346	-0.6638	-0.3179	-0.5635	-0.4303	0.0801	-0.6702	-0.351	-0.0604	-0.3232
PD_Wt_BasePlus2	-0.8196	-0.8559	-0.7671	-0.9562	-1.2225	-0.1873	-0.5767	-0.6912	-1.0936	-0.2975	-0.6792	-0.9774
OP_Before	-0.517	-0.4825	-0.5669	-1.1607	-0.4505	0.9192	-0.4366	-1.0456	1.4704	1.4005	0.9328	-0.735
OP_After	0.517	0.4825	0.5669	1.1607	0.4505	-0.9192	0.4366	1.0456	-1.4704	-1.4005	-0.9328	0.735
Walk_Dep_Base	0.2712	0.3943	0.0933	-0.0269	-0.0879	1.7361	0.4594	0.9695	-1.4352	-0.6174	-0.3845	0.3521
Walk_Dep_BaseMinus1	-0.1142	-0.1184	-0.1082	0.8674	0.0196	-2.3675	-0.6145	-0.9273	0.3441	-1.5864	0.6487	0.1558
Walk_Dep_BaseMinus2	-0.157	-0.276	0.0149	-0.8405	0.0683	0.6315	0.1551	-0.0422	1.0911	2.2038	-0.2642	-0.5079
Walk_Orig_Drop_Off	0.6322	0.8451	0.3247	0.024	1.6474	1.4821	0.4793	0.8631	0.046	0.6724	-0.6311	1.0456
Walk_Orig_Park_4Dollars	-0.294	-0.3201	-0.2563	0.091	-0.9787	-0.4117	0.0514	-1.1544	-0.3956	-2.3929	0.1273	-0.2517
Walk_Orig_Park_8Dollars	-1.3094	-1.309	-1.31	-0.6559	-0.4388	-1.9841	-1.209	-1.4046	-0.6121	3.0092	-0.0175	-2.6334
Walk_Orig_Shuttle	0.9712	0.784	1.2416	0.5409	-0.2299	0.9136	0.6783	1.6958	0.9616	-1.2887	0.5212	1.8396
Walk_Dest_Park_4Dollars	0.4037	0.7207	-0.0543	-0.5778	0.6042	1.0309	1.3871	0.4345	0.8957	0.1527	-0.9905	0.1625
Walk_Dest_Park_8Dollars	-0.9917	-1.1451	-0.7702	0.0273	-1.4338	-1.4834	-0.4993	-3.0574	-0.6596	0.2605	0.2934	-1.4262
Walk_Dest_Shuttle	0.588	0.4243	0.8245	0.5505	0.8296	0.4525	-0.8879	2.6229	-0.2361	-0.4132	0.697	1.2637
Price_Minus_20	1.2382	1.0003	1.5817	1.2434	1.4004	1.3461	1.6755	0.4357	1.0531	0.7911	1.144	1.2021
Price_Minus_15	0.9915	0.8288	1.2264	1.069	1.2113	1.269	1.1601	0.4354	0.8123	0.2331	1.0894	0.9815
Price_Minus_10	0.6505	0.5765	0.7573	0.7875	0.9762	0.6432	0.6951	0.3272	0.8109	0.2328	0.4277	0.5571
Price_Minus_5	0.5183	0.4695	0.5888	0.5352	0.8134	0.1976	0.5634	0.3234	0.8108	0.2327	0.2822	0.4972
Price_Base_Price	0.176	0.1511	0.2121	0.1539	0.5919	0.1893	0.1131	0.0968	0.3487	0.2327	0.0464	0.1439
Price_Plus_5	-0.0871	0.005	-0.2201	-0.0099	-0.4739	-0.1224	-0.1561	-0.0194	0.0569	0.2233	0.0222	-0.0547
Price_Plus_10	-0.3788	-0.3032	-0.4881	-0.3176	-0.7573	-0.1225	-0.4456	-0.2328	-0.0214	0.0612	-0.2713	-0.4835
Price_Plus_15	-0.6469	-0.6198	-0.6861	-0.5724	-0.8734	-0.1226	-0.9702	-0.2357	-0.951	-0.4629	-0.8014	-0.5351
Price_Plus_20	-1.0535	-0.8965	-1.2803	-1.1767	-1.442	-1.5939	-1.159	-0.2665	-1.3881	-0.7307	-0.9436	-0.976
Price_Plus_25	-1.4081	-1.2118	-1.6917	-1.7122	-1.4466	-1.6836	-1.4763	-0.8641	-1.5322	-0.8133	-0.9958	-1.3326
NONE	-5.0977	-5.8268	-4.0445	-3.7737	0.7651	-9.7895	-2.8544	-11.8755	1.2651	-7.6365	-5.6944	-7.3767

Simulator

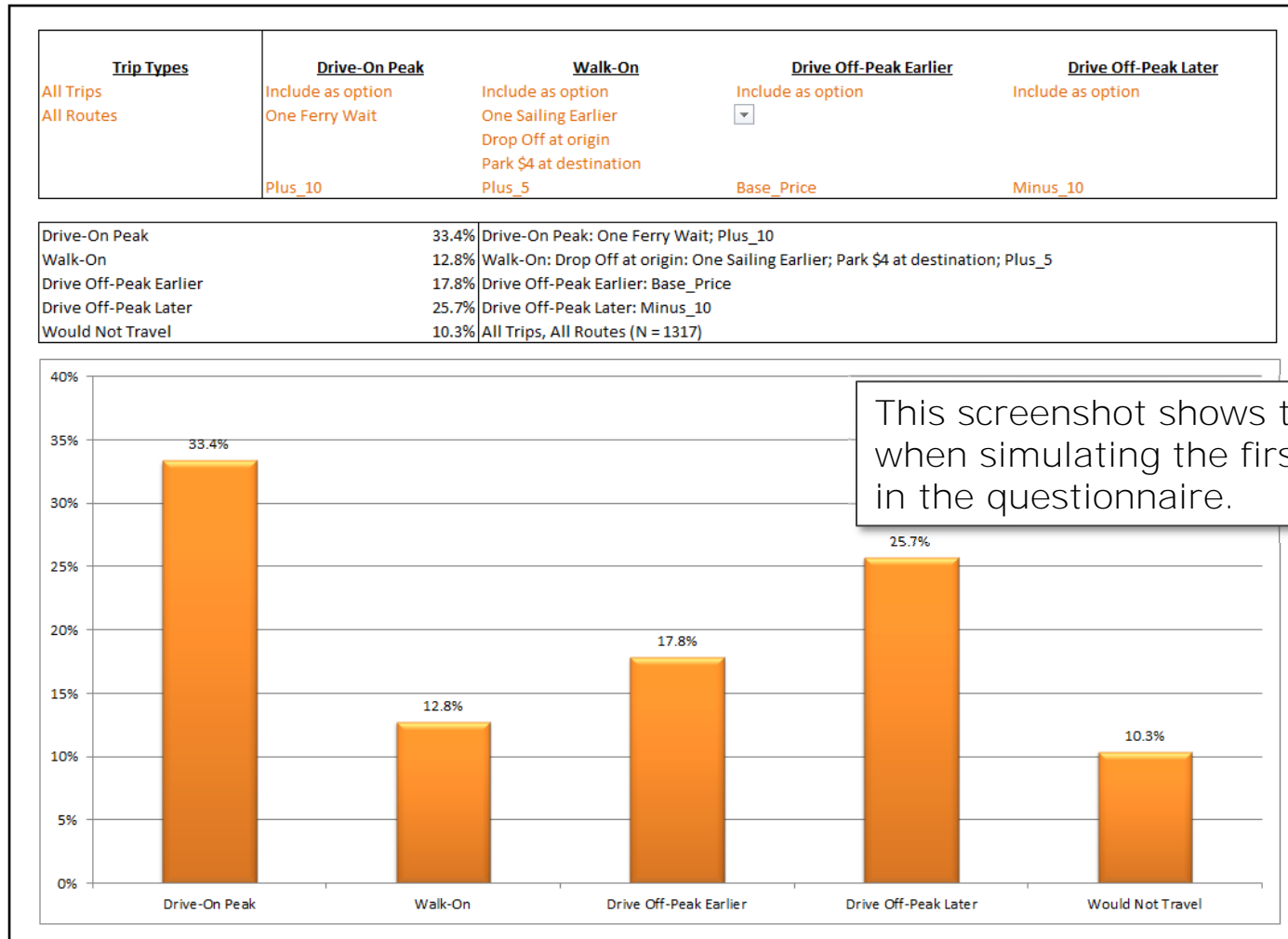
- A simulator was developed to allow analysis of specific scenarios
 - Logit-based
 - Respondent level
 - Allows for population to be cut by travel type and route
- Note that when using the simulator the limitations in the original design must be kept in mind: there is likely to be an element of **'over-fitting', which means that some utilities may be exaggerated.** However, the results seem fairly reliable.

Price Sensitivity: Drive-On Peak Only

- A logit simulation of Drive-On Peak (at desired time) versus 'NONE' gives the following sensitivity Curve:



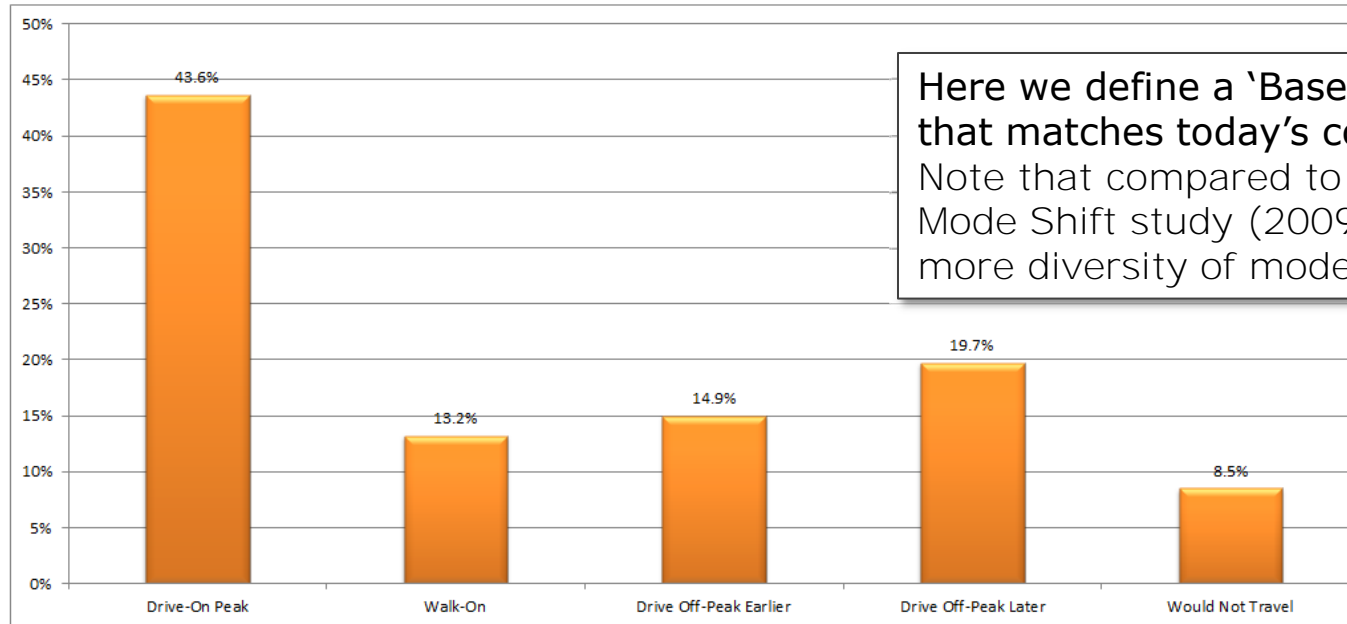
Simulator Interface



Base Scenario

<u>Trip Types</u>	<u>Drive-On Peak</u>	<u>Walk-On</u>	<u>Drive Off-Peak Earlier</u>	<u>Drive Off-Peak Later</u>
All Trips	Include as option	Include as option	Include as option	Include as option
All Routes	No Wait	Base Sailing Drop Off at origin Shuttle at destination		
	Base_Price	Base_Price	Base_Price	Base_Price

Drive-On Peak	43.6%	Drive-On Peak: No Wait; Base_Price
Walk-On	13.2%	Walk-On: Drop Off at origin; Base Sailing; Shuttle at destination; Base_Price
Drive Off-Peak Earlier	14.9%	Drive Off-Peak Earlier: Base_Price
Drive Off-Peak Later	19.7%	Drive Off-Peak Later: Base_Price
Would Not Travel	8.5%	All Trips, All Routes (N = 1317)



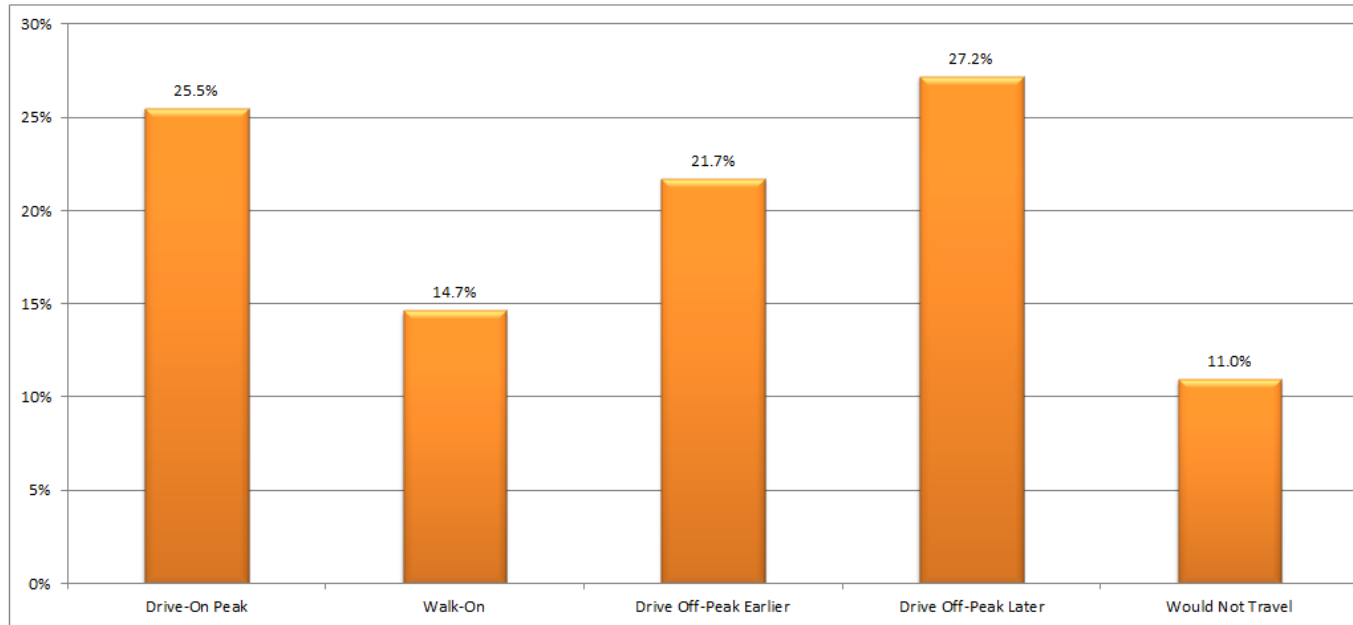
Here we define a 'Base' Scenario that matches today's conditions. Note that compared to the previous Mode Shift study (2009) this shows more diversity of mode.

Extreme 'Best' Scenario

This 'Best' scenario shows the effect of making Peak Drive-On travel as unattractive as possible, and other modes as attractive as possible. This gives us a view of the maximum Mode Shift possible within the tested parameters. This gives a reduction in Peak Drive-On demand of 42% (A shift from 43.6% to 25.5%)

<u>Trip Types</u>	<u>Drive-On Peak</u>	<u>Walk-On</u>	<u>Drive Off-Peak</u>
All Trips	Include as option	Include as option	Include as option
All Routes	Two Ferry Wait	Base Sailing Shuttle at origin Shuttle at destination	
	Plus_25	Minus_20	Minus_20

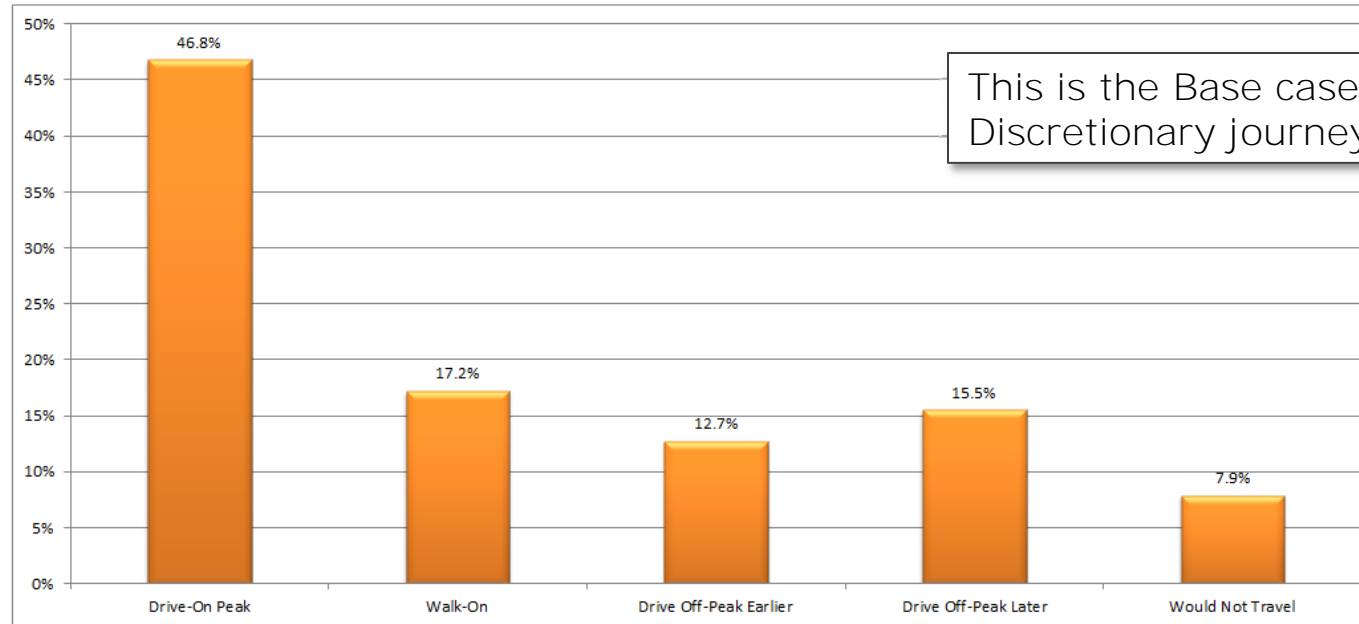
Drive-On Peak	25.5%	Drive-On Peak: Two Ferry Wait; Plus_25
Walk-On	14.7%	Walk-On: Shuttle at origin: Base Sailing; Shuttle at de
Drive Off-Peak Earlier	21.7%	Drive Off-Peak Earlier: Minus_20
Drive Off-Peak Later	27.2%	Drive Off-Peak Later: Minus_20
Would Not Travel	11.0%	All Trips, All Routes (N = 1317)



Base Case: Non-Discretionary Journeys Only

<u>Trip Types</u>	<u>Drive-On Peak</u>	<u>Walk-On</u>	<u>Drive Off-Peak Earlier</u>	<u>Drive Off-Peak Later</u>
Non-Discretionary Trips	Include as option	Include as option	Include as option	Include as option
All Routes	No Wait	Base Sailing Drop Off at origin Shuttle at destination		
	Base_Price	Base_Price	Base_Price	Base_Price

Drive-On Peak	46.8%	Drive-On Peak: No Wait; Base_Price
Walk-On	17.2%	Walk-On: Drop Off at origin: Base Sailing; Shuttle at destination; Base_Price
Drive Off-Peak Earlier	12.7%	Drive Off-Peak Earlier: Base_Price
Drive Off-Peak Later	15.5%	Drive Off-Peak Later: Base_Price
Would Not Travel	7.9%	Non-Discretionary Trips, All Routes (N = 769)

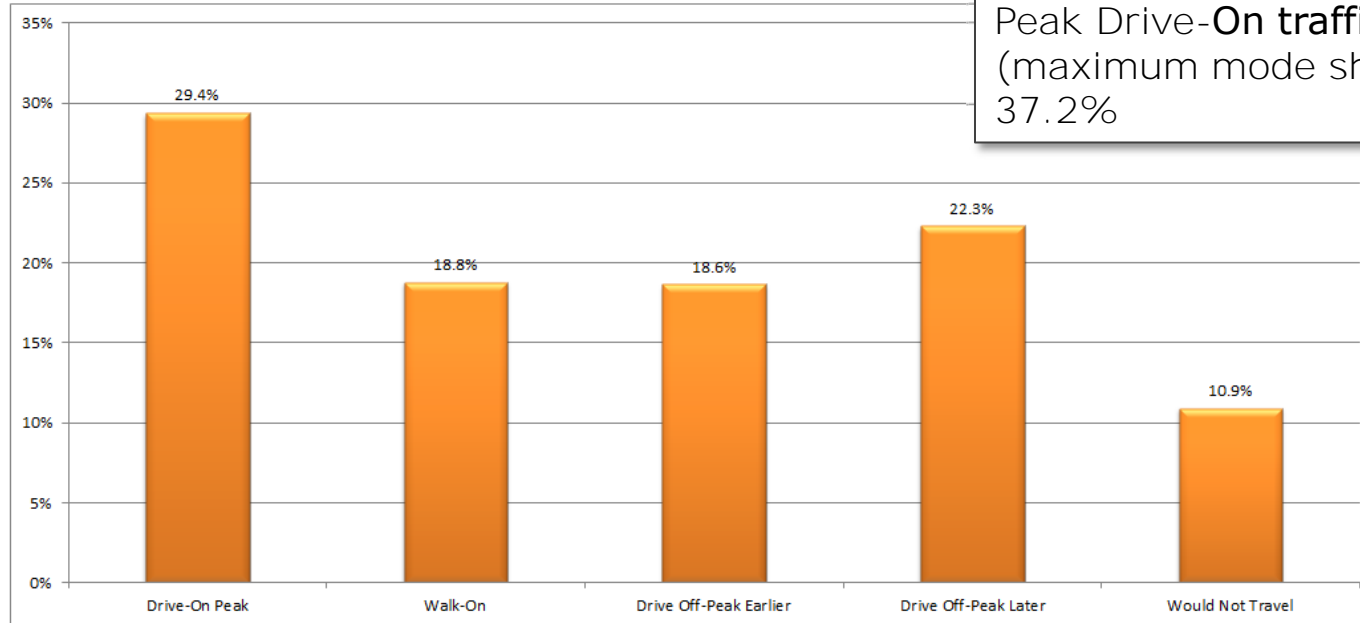


This is the Base case, but for Non-Discretionary journeys only

Best Case: Non-Discretionary Journeys Only

<u>Trip Types</u>	<u>Drive-On Peak</u>	<u>Walk-On</u>	<u>Drive Off-Peak Earlier</u>	<u>Drive Off-Peak Later</u>
Non-Discretionary Trips	Include as option	Include as option	Include as option	Include as option
All Routes	Two Ferry Wait	Base Sailing Shuttle at origin Shuttle at destination		
	Plus_25	Minus_20	Minus_20	Minus_20

Drive-On Peak	29.4%	Drive-On Peak: Two Ferry Wait; Plus_25
Walk-On	18.8%	Walk-On: Shuttle at origin; Base Sailing; Shuttle at destination; Minus_20
Drive Off-Peak Earlier	18.6%	Drive Off-Peak Earlier: Minus_20
Drive Off-Peak Later	22.3%	Drive Off-Peak Later: Minus_20
Would Not Travel	10.9%	Non-Discretionary Trips, All Routes (N = 769)



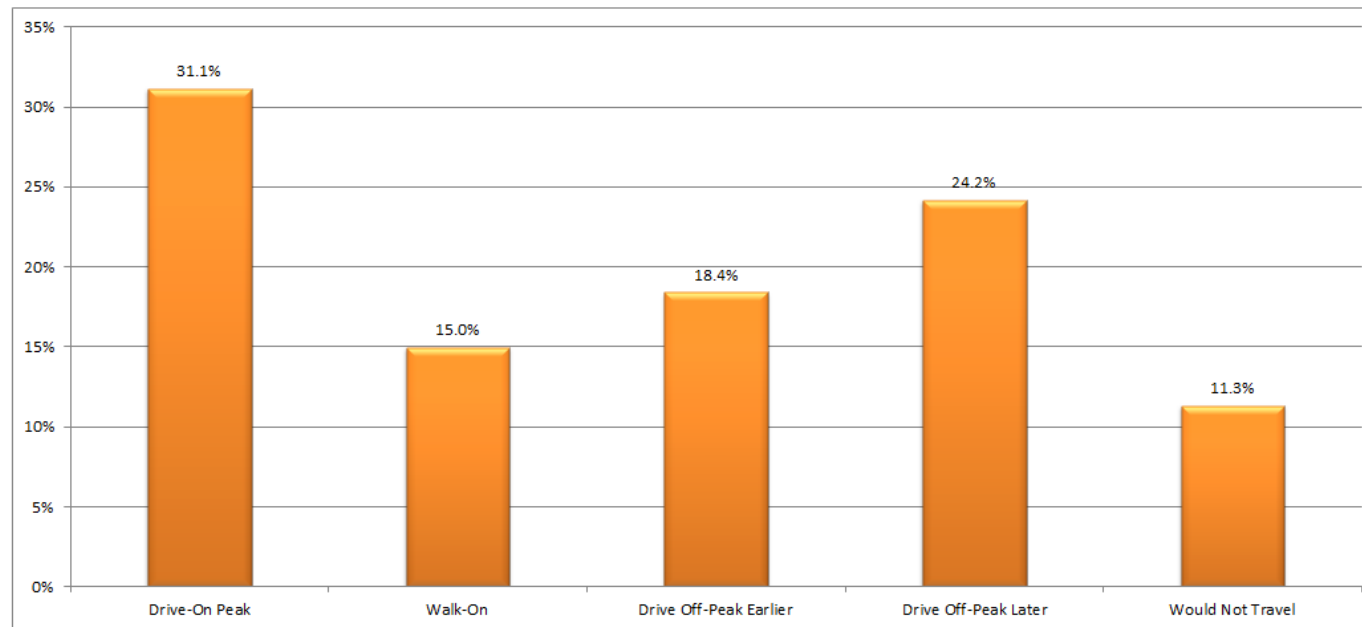
Here we see that the reduction in Peak Drive-On traffic for the 'Best' (maximum mode shift) scenario is 37.2%

Current Case, But Peak-Time Wait

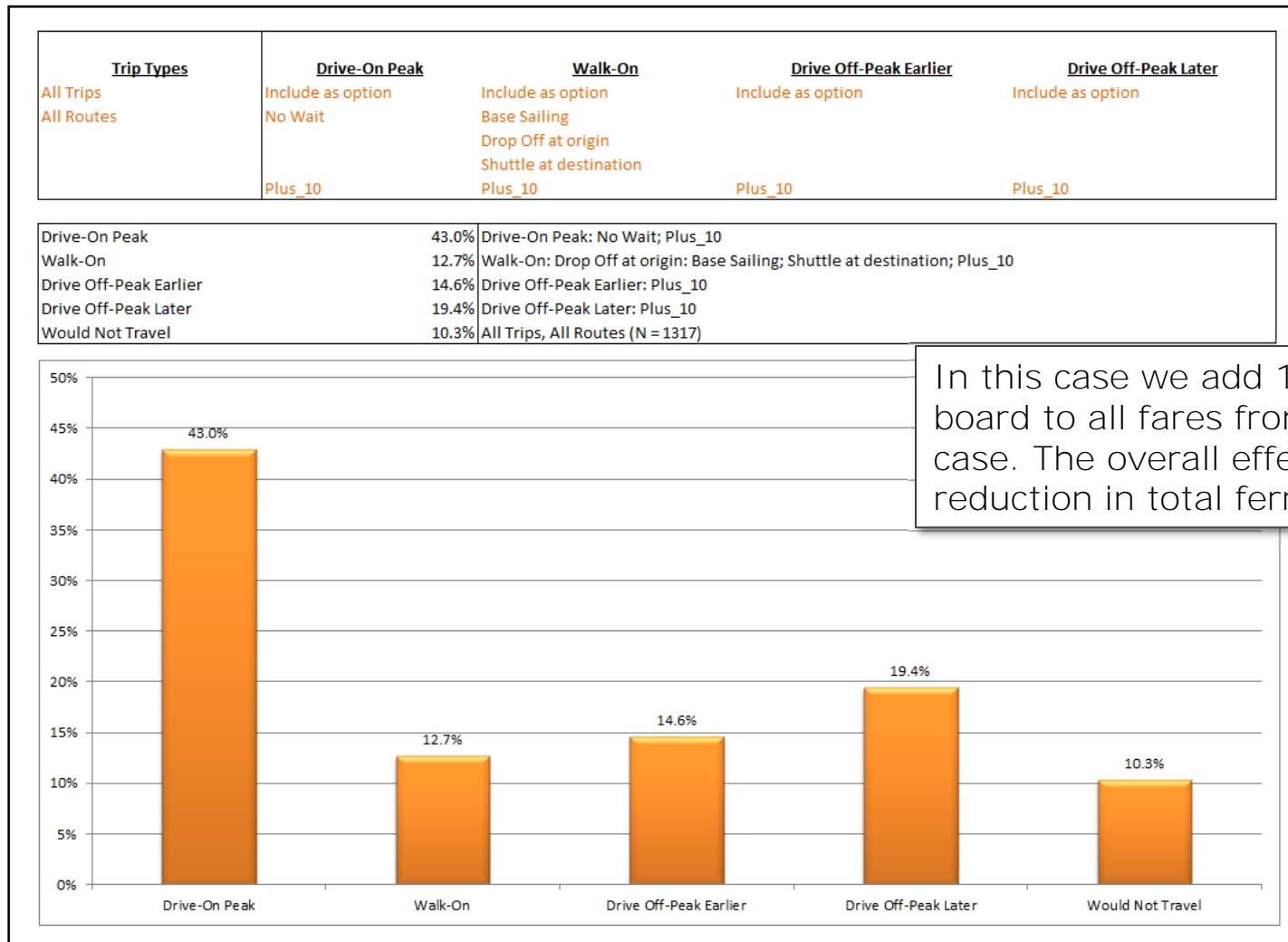
In this case we take the current scenario, but show the effect of a two-ferry wait for the peak sailings. The effect is a reduction in Peak Drive-On demand of 28.6%. The overall decline in total ridership is 3.1%

<u>Trip Types</u>	<u>Drive-On Peak</u>	<u>Walk-On</u>	<u>Drive Off-Peak</u>
All Trips	Include as option	Include as option	Include as option
All Routes	Two Ferry Wait	Base Sailing	
		Drop Off at origin	
		Shuttle at destination	
	Base_Price	Base_Price	Base_Price

Drive-On Peak	31.1%	Drive-On Peak: Two Ferry Wait; Base_Price
Walk-On	15.0%	Walk-On: Drop Off at origin: Base Sailing; Shuttle at destination; Base_Price
Drive Off-Peak Earlier	18.4%	Drive Off-Peak Earlier: Base_Price
Drive Off-Peak Later	24.2%	Drive Off-Peak Later: Base_Price
Would Not Travel	11.3%	All Trips, All Routes (N = 1317)



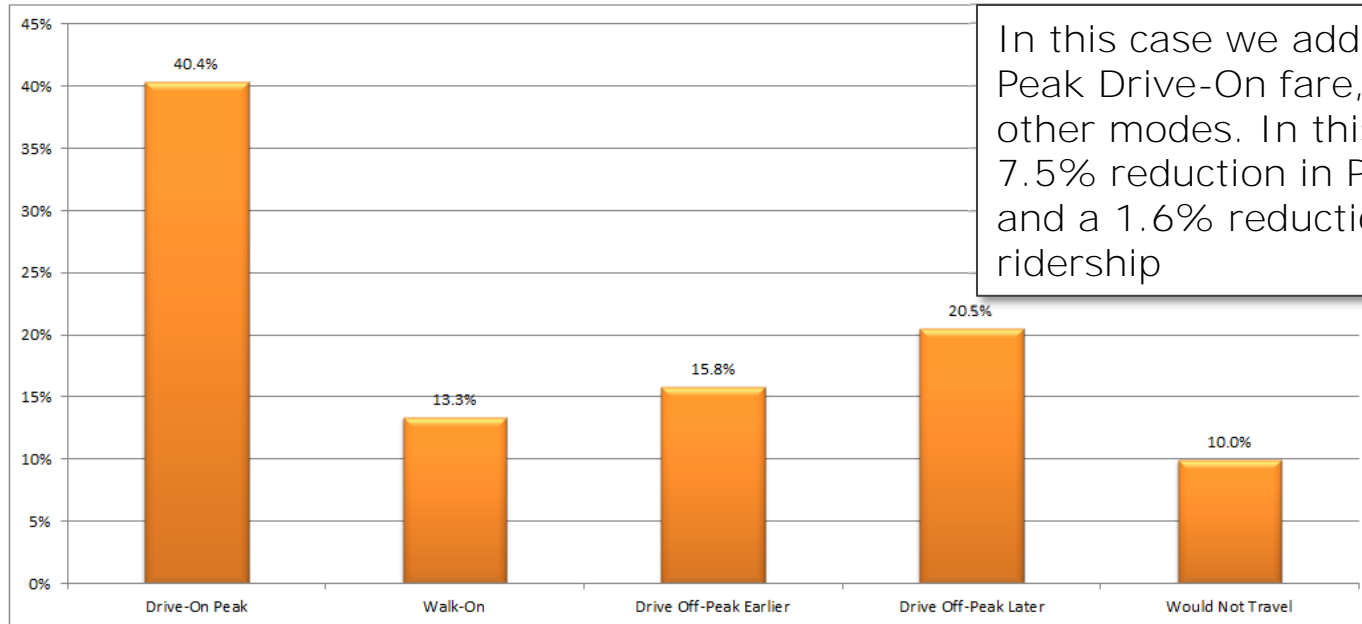
Across-The-Board Fare Increase of 10%



15% Increase to Peak Drive-on, 5% to Other Modes

<u>Trip Types</u>	<u>Drive-On Peak</u>	<u>Walk-On</u>	<u>Drive Off-Peak Earlier</u>	<u>Drive Off-Peak Later</u>
All Trips All Routes	Include as option No Wait Plus_15	Include as option Base Sailing Drop Off at origin Shuttle at destination Plus_5	Include as option Plus_5	Include as option Plus_5

Drive-On Peak	40.4%	Drive-On Peak: No Wait; Plus_15
Walk-On	13.3%	Walk-On: Drop Off at origin: Base Sailing; Shuttle at destination; Plus_5
Drive Off-Peak Earlier	15.8%	Drive Off-Peak Earlier: Plus_5
Drive Off-Peak Later	20.5%	Drive Off-Peak Later: Plus_5
Would Not Travel	10.0%	All Trips, All Routes (N = 1317)



In this case we add 15% to the Peak Drive-On fare, and 5% to the other modes. In this case we see a 7.5% reduction in Peak Drive-On, and a 1.6% reduction in total ferry ridership

Scenario Summary

<u>Demand</u>						Non-Discretionary	
	Base	Best	Peak Wait	Plus 10%	Plus 15/5%	Base	Best
Drive-On Peak	43.6%	25.5%	31.1%	43.0%	40.4%	46.8%	29.4%
Walk-On	13.2%	14.7%	15.0%	12.7%	13.3%	17.2%	18.8%
Drive Off-Peak Earlier	14.9%	21.7%	18.4%	14.6%	15.8%	12.7%	18.6%
Drive Off-Peak Later	19.7%	27.2%	24.2%	19.4%	20.5%	15.5%	22.3%
Would Not Travel	8.5%	11.0%	11.3%	10.3%	10.0%	7.9%	10.9%
Total Car Ridership	78.3%	74.4%	73.7%	77.0%	76.7%	75.0%	70.3%
Total Ridership inc Walk	91.5%	89.0%	88.7%	89.7%	90.0%	92.1%	89.1%
<u>Change from Base Case</u>							
Drive-On Peak	-	-41.6%	-28.6%	-1.6%	-7.5%		-37.2%
Walk-On	-	11.2%	13.5%	-3.8%	1.3%		9.2%
Drive Off-Peak Earlier	-	45.2%	23.0%	-2.4%	5.8%		47.1%
Drive Off-Peak Later	-	37.9%	22.6%	-1.4%	4.0%		44.0%
Would Not Travel	-	28.7%	33.1%	21.3%	17.0%		38.7%
Total Car Ridership	-	-5.0%	-5.9%	-1.7%	-2.1%		-6.2%
Total Ridership inc Walk	-	-2.7%	-3.1%	-2.0%	-1.6%		-3.3%

Observations

- Despite limitations in the model, reasonable utilities were extracted for most of the levels tested
 - Some attributes/levels may be less accurate, but the utilities offered are believed to be generally representative
- Utilities are available at the Route, Trip-Type and ultimately Respondent level for further simulation
- A number of Simulations have been run. Key results are:
 - The simulation shows that raising the system-wide prices by 10% would result in a drop in total ferry ridership of 2%
 - An increase of 15% to Peak Drive-On fares, together with a rise of 5% for all other modes results in a 7.5% reduction in Peak Drive-On, and a 1.6% reduction in total ferry ridership



Appendix E: Questionnaire



Questionnaire

WSTC Mode Shift

[] = HEADING NOT SHOWN TO RESPONDENTS

[] = NEW ITEMS ADDED OR CHANGED

Introduction

Dear Washington State Ferries Rider:

Thank you for your interest in the Washington State Ferries and the Ferry Riders' Opinion Group (F.R.O.G.).

Washington State Ferries is looking for ways to reduce peak period congestion and make better use of its capacity throughout the hours of the day and days of the week, so that the need to fund additional capital expenditures for added capacity in terminals and on ferries could be reduced.

We greatly appreciate you taking time out of your busy day to complete this survey. This is your opportunity to voice your opinions and concerns on some important ferry issues.

Your comments will influence critical decisions at the state level, so please join us in this important study!

Sincerely,
Philip Parker, Chairman
Washington State Transportation Commission

Mode Shift Study Explanation

Before you get started, we would like to explain a little about this study to you.

The first set of questions (Approximately 9) will ask you about your most recent drive-on ferry trip **during a normally congested travel time**. The aim of these questions is to learn what it costs you in time, money and effort to make the entire trip; not just the ferry part.

Next, you will see twelve sets of possible alternatives you might encounter for making that same trip in the future. The alternatives will include all of the time, money, and effort you would expend in making your trip. We'd like to have you tell us, by choosing among these options, how you would make that trip if the alternatives shown were the choices available to you for the trip.

These alternatives might not exactly match your particular situation, but they have been designed such that we can measure the relative importance of the various elements that go into a complete trip.

We know our customers use the ferries as a means to an end, not an end in itself. The survey results will help us make sure all riders are able to make their trips in a cost- and time-effective manner. Thank you for your help, and on with the survey.

Most Recent Drive-On Trip

Q1. Thinking of the last time you drove on to a ferry as a driver, in which of these directions and time periods did your trip start?

WEEKDAYS:

EASTBOUND -- From 5:00 am to 8:30 am any weekday (or from 6:30 am to 5:15 pm on the Port Townsend/Keystone ferry)

EASTBOUND -- Any other times

WESTBOUND -- From 3:00 pm to 7:00 pm any weekday (or from 12:00 Noon to 6:00 pm on the Port Townsend/Keystone ferry)

WESTBOUND -- Any other times

SATURDAYS:

WESTBOUND -- From 9:00 am to 4:00 pm (or from 10:15 am to 3:15 pm on the Port Townsend/Keystone ferry)

WESTBOUND -- Any other times

EASTBOUND -- Any other times

SUNDAYS:

EASTBOUND -- From 12:00 Noon to 6:00 pm (or from 12:45 pm to 3:00 pm on the Port Townsend/Keystone ferry)

EASTBOUND -- Any other times

WESTBOUND -- Any other times

→ IF NOT A PEAK PERIOD ASK:

The direction and/or time period you selected does not fall into a normally congested travel time. The following question(s) will determine your last drive-on ferry trip during what is considered a normally congested travel time. **It is this drive-on ferry trip that we will reference throughout the remainder of the survey.**

Q1a. When was the last time you drove on the ferry going Eastbound between 5:00 am to 8:30 am (or from 6:30 am to 5:15 pm on the Port Townsend/Keystone ferry) on a weekday?

- 1 0 to 3 months ago → GO TO Q2
- 2 Over 3 months ago or never → CONTINUE

Q1b. When was the last time you drove on the ferry going Westbound between 3:00 pm to 7:00 pm (or from 12:00 Noon to 6:00 pm on the Port Townsend/Keystone ferry) on a weekday?

- 1 0 to 3 months ago → GO TO Q2
- 2 Over 3 months ago or never → CONTINUE

Q1c. When was the last time you drove on the ferry going Eastbound between 12:00 Noon to 6:00 pm (or from 12:45 pm to 3:00 pm on the Port Townsend/Keystone ferry) on a Sunday?

- 1 0 to 3 months ago → GO TO Q2
- 2 Over 3 months ago or never → CONTINUE

Q1d. When was the last time you drove on the ferry going Westbound between 9:00 am to 4:00 pm (or from 10:15 am to 3:15 pm on the Port Townsend/Keystone ferry) on a Saturday?

- 1 0 to 3 months ago → GO TO Q2
- 2 Over 3 months ago or never → TERMINATE



Questionnaire (cont.)

Q2. What route did you take for your last [INSERT Q1 RESPONSE] trip?

- 11 Seattle/Bainbridge
 - 12 Seattle/Bremerton
 - 13 Point Defiance/Tahlequah
 - 14 Edmonds/Kingston
 - 15 Fauntleroy/Vashon
 - 16 Fauntleroy/Southworth
 - 17 Southworth/Vashon
 - 18 Port Townsend/Keystone
 - 19 Mukilteo/Clinton
 - 20 Anacortes/Friday Harbor
 - 21 Anacortes/Lopez
 - 22 Anacortes/Orcas
 - 23 Anacortes/Shaw
 - 24 San Juan Interisland
 - 25 Anacortes/Sydney
- } TERMINATE

Q2a. What day of the week was your last [INSERT Q1 RESPONSE] trip?

(INSERT MONDAY – SUNDAY)

ADD A "YOUR TRIP" SUMMARY TABLE FOR EACH QUESTION STARTING AT Q2b THROUGH Q11. FOR EACH QUESTION, AN ADDITIONAL ITEM WILL BE ADDED STATING THE ANSWER FOR THE PREVIOUS QUESTION. WHEN DEFINING THE TITLE "YOUR TRIP", PLEASE ADD "YOUR [INSERT Q1 RESPONSE] TRIP"

Q4. What was your primary purpose for the trip described above? Please select the category that best fits the primary purpose of your trip from the drop-down menu below.

- 11 Commute to / from work
- 12 Commute to / from school
- 13 Work related activity / business
- 14 Personal business / activity
- 15 Medical appointment
- 16 Everyday shopping
- 17 Shopping excursion
- 18 Tourism / recreation
- 19 Travel to / from special event
- 20 Travel to / from to see family / friends
- 99 Other → Please specify

Q5. What was the scheduled departure time of the ferry you were on for this trip?

(SHOW ON-PEAK SCHEDULE FOR ROUTE CHOSEN IN Q2 AND DAY OF WEEK – MON-FRI vs. SAT-SUN)

Q6. About how many minutes did it take to drive to the ferry terminal at the time of day you made this trip? (Not including any extra stops, such as to drop kids off at school/etc., you made on the way) Please round to the nearest 10 minutes.

(SHOW DROP DOWN MENU WITH 10 MINUTE INCREMENTS)

Q7. After you reached the ferry terminal, about how long did you have to wait before getting on a boat? Please round to the nearest 5 minutes.

(SHOW DROP DOWN MENU WITH 5 MINUTE INCREMENTS)

Q8. What type of fare ticket did you purchase for this trip?

- o Regular Fare -- Vehicle & Driver
- o Multi-Ride Commuter Card -- Vehicle & Driver
- o Senior / Disabled Fare -- Vehicle & Driver
- o Something Else (Please describe)

FARES	SEA/ BAIN	SEA/ BRE	PTD/ TAH	EDM/ KIN	FAU/ VAS	FAU/ SOU	SOU/ VAS	PTT/ KEY	MUK/ CLJ
Regular fare	\$14.85	\$14.85	\$19.00	\$14.85	\$19.00	\$11.45	\$19.00	\$11.45	\$9.75
Multi-ride	\$9.40	\$9.40	\$12.16	\$9.40	\$12.16	\$7.32	\$12.16	\$7.32	\$5.60
Senior/Disabled	\$13.10	\$13.10	\$16.75	\$13.10	\$16.75	\$10.10	\$16.75	\$10.10	\$7.70

IN THE "YOUR TRIP" SUMMARY, DO NOT SHOW CROSSING TIME UNTIL Q9

Q9. After you departed the ferry about how many minutes did it take to drive from the ferry terminal to your final destination at the time of day you made this trip? (Not including any extra stops you made on the way) Please round to the nearest 10 minutes.

(SHOW DROP DOWN MENU WITH 10 MINUTE INCREMENTS)

Q10. Based on the information you gave me, this trip took approximately [Q6+Q7+Q9+sailing time by route selected in Q2] minutes from when you left to when you reached your final destination?

SAILING TIME	SEA/ BAIN	SEA/ BRE	PTD/ TAH	EDM/ KIN	FAU/ VAS	FAU/ SOU	SOU/ VAS	PTT/ KEY	MUK/ CLJ
	35 min	60 min	35 min	30 min	20 min	40 min	10 min	30 min	20 min

- Yes, that sounds right
- No, that doesn't sound quite right → Q10A. How many minutes would you say it was?
Please round to the nearest 10 minutes. (SHOW DROP DOWN MENU WITH 10 MINUTE INCREMENTS)

Q11. Beyond your ferry fare of \$[Show fare based on answer for Q8 and Route Q2] what would you estimate you spend in gas, parking, and other costs getting from your starting point to your final destination? Please estimate your gas, parking and other expenses to the nearest \$.50. (SHOW DROP DOWN MENU WITH \$.50 INCREMENTS, STARTING WITH UNDER \$1.00 AND ENDING WITH \$15.00 OR MORE)

Q12. Given that the driving portion of your trip takes approximately [Q6+Q7+Q9+sailing time by route selected in Q2] minutes, does [INSERT Q11] seem reasonable to cover gas, parking and the other costs associated with getting to your final destination?

- Yes, that sounds right
- No, that doesn't sound quite right → Q12A. what would you estimate it costs for gas, parking, and other expenses to get from your starting point to your final destination?
Please estimate your gas, parking and other expenses to the nearest \$.50. (SHOW DROP DOWN MENU WITH \$.50 INCREMENTS, STARTING WITH UNDER \$1.00 AND ENDING WITH \$15.00 OR MORE)



Questionnaire (cont.)

Mode Shift Conjoint Introduction

On the next 12 screens, you'll see several "possible alternatives" describing different travel scenarios.

On each screen, five possible travel scenarios are presented:

- Current Drive-on option
- Walk-on option
- Drive on earlier option
- Drive on later option
- Don't take the ferry option

Each scenario is comprised of method of travel to and from the ferry, travel time and travel costs. For routes where fares are collected in only one direction, the amount shown in the "Ferry Fare" is based on half of the fare collected for a round trip.

As we mentioned at the start of this survey, these alternatives might not exactly match your particular situation, but they have been designed such that we can measure the relative importance of the various elements that go into a complete trip.

Therefore, imagine that these are the realities you're faced with, when making the previously mentioned trip. Please pick the travel scenario that you would MOST LIKELY use if these were your only options.

1 SAILING WAIT TIMES	SEA/ BAUN	SEA/ BRE	PTD/ TAH	EDM/ KIN	FAU/ VAS	FAU/ SOU	SOU/ VAS	PTT/ KEY	MUK/ CLI
Weekday	00:30	01:15	00:53	00:45	00:29	00:46	00:58	01:40	00:29
Weekend	00:52	01:16	00:56	00:46	00:28	00:45	00:55	01:51	00:30

Prior to each Table: If Scenario #1 were the only travel options available when you were making your previous [INSERT DIRECTION] [INSERT ROUTE] trip for the purpose of [INSERT PURPOSE], which option would you have MOST LIKELY chosen? (To make it easier, major differences between options & scenarios are highlighted in yellow)

Scenario 1 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON (at peak)	WALK-ON (at peak)	DRIVE ON EARLIER (off peak)	DRIVE ON LATER (off peak)	WON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Dropped off at terminal	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on- island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$4	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	One sailing earlier than Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + one sailing	3 min	3 min	3 min	
FERRY FARE	Current vehicle fare +10%	Current passenger fare +5%	Current vehicle fare 0%	Current vehicle fare -10%	
TOTAL TRAVEL TIME	(Q10) min. + addtl wait time	(Q10) min.	(Q10) min. less (Q7A) + 3 min.	(Q10) min. less (Q7A) + 3 min.	

TOTAL TRAVEL COSTS	(Q11) response + addtl fare	Walk on fare + parking costs +Q11*(Q9/(Q6 +Q9))	(Q11) less off peak fare savings	(Q11) less off peak fare savings	with another trip or not at all).
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Scenario 2 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$4/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on- island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$8	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	=Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + two sailings	3 min	3 min	3 min	
FERRY FARE	Current vehicle fare +15%	Current passenger fare 0%	Current vehicle fare -5%	Current vehicle fare -15%	
TOTAL TRAVEL TIME	(Q10) min. + addtl wait time	(Q10) min.	(Q10) min. less (Q7A) + 3 min.	(Q10) min. less (Q7A) + 3 min.	
TOTAL TRAVEL COSTS	(Q11) response + addtl fare	Walk on fare + parking costs + Q11	(Q11) less off peak fare savings	(Q11) less off peak fare savings	



Questionnaire (cont.)

Scenario 3 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$8/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Shuttle to transit center	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	One sailing earlier than Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response	3 min	3 min	3 min	
FERRY FARE	Current vehicle fare +20%	Current passenger fare -3%	Current vehicle fare -10%	Current vehicle fare -20%	
TOTAL TRAVEL TIME	(Q10) min. + add'l wait time	(Q10) min. + Q9	(Q10) min. less (Q7A) + 3 min.	(Q10) min. less (Q7A) + 3 min.	
TOTAL TRAVEL COSTS	(Q11) response + add'l fare	Walk on fare + \$1.50 + parking costs + Q11*(Q6/(Q6+Q9))	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario 4 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Park free & ride transit	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$4	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	Two sailings earlier than Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + one sailing	3 min	3 min	3 min	
FERRY FARE	Current vehicle fare +25%	Current passenger fare -10%	Current vehicle fare -15%	Current vehicle fare +3%	
TOTAL TRAVEL TIME	(Q10) min. + add'l wait time	(Q10) min. + Q6*0.25	(Q10) min. less (Q7A) + 3 min.	(Q10) min. less (Q7A) + 3 min.	
TOTAL TRAVEL COSTS	(Q11) response + add'l fare	Walk on fare + \$1.50 + parking costs + Q11*(Q6/(Q6+Q9))	(Q11) less off peak fare savings	(Q11) less off peak fare savings	
Scenario	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E

5 of 12	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
MAJOR TRAVEL OPTIONS					
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Dropped off at terminal	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$8	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	=Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + two sailings	3 min	3 min	3 min	
FERRY FARE	Current vehicle fare 0%	Current passenger fare -15%	Current vehicle fare -20%	Current vehicle fare 0%	
TOTAL TRAVEL TIME	(Q10) min. + add'l wait time	(Q10) min.	(Q10) min. less (Q7A) + 3 min.	(Q10) min. less (Q7A) + 3 min.	
TOTAL TRAVEL COSTS	(Q11) response + add'l fare	Walk on fare + parking costs + Q11*(Q6/(Q6+Q9))	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario 6 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$4/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-island or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Shuttle to transit center	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	Two sailings earlier than Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response	3 min	3 min	3 min	
FERRY FARE	Current vehicle fare +5%	Current passenger fare -20%	Current vehicle fare +5%	Current vehicle fare -5%	
TOTAL TRAVEL TIME	(Q10) min. + add'l wait time	(Q10) min. + Q9	(Q10) min. less (Q7A) + 3 min.	(Q10) min. less (Q7A) + 3 min.	
TOTAL TRAVEL COSTS	(Q11) response + add'l fare	Walk on fare + \$1.50 + parking costs + Q11*(Q6/(Q6+Q9))	(Q11) less off peak fare savings	(Q11) less off peak fare savings	



Questionnaire (cont.)

Scenario 7 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$8/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-stand or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$4	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	=Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + one sailing	3 min	3 min	3 min	
FERRY FARE	Current vehicle fare +10%	Current passenger fare +5%	Current vehicle fare 0%	Current vehicle fare -10%	
TOTAL TRAVEL TIME	(Q10) min. + add'l wait time	(Q10) min.	(Q10) min. less (Q7A) + 3 min.	(Q10) min. less (Q7A) + 3 min.	
TOTAL TRAVEL COSTS	(Q11) response + add'l fare	Walk on fare + parking costs + Q11	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario 8 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Park free & ride transit	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-stand or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$8	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	Two sailings earlier than Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + two sailings	3 min	3 min	3 min	
FERRY FARE	Current vehicle fare +15%	Current passenger fare 0%	Current vehicle fare -5%	Current vehicle fare -15%	
TOTAL TRAVEL TIME	(Q10) min. + add'l wait time	(Q10) min. + Q6*0.25	(Q10) min. less (Q7A) + 3 min.	(Q10) min. less (Q7A) + 3 min.	
TOTAL TRAVEL COSTS	(Q11) response + add'l fare	Walk on fare + \$1.50 + parking costs + Q11	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario 9 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Dropped off at terminal	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-stand or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Shuttle to transit center	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	One sailing earlier than Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response	3 min	3 min	3 min	
FERRY FARE	Current vehicle fare +20%	Current passenger fare -5%	Current vehicle fare -10%	Current vehicle fare -20%	
TOTAL TRAVEL TIME	(Q10) min. + add'l wait time	(Q10) min. + Q3	(Q10) min. less (Q7A) + 3 min.	(Q10) min. less (Q7A) + 3 min.	
TOTAL TRAVEL COSTS	(Q11) response + add'l fare	Walk on fare + \$1.50 + parking costs	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario 10 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGINATION SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$4/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-stand or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$4	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	=Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + one sailing	3 min	3 min	3 min	
FERRY FARE	Current vehicle fare +25%	Current passenger fare -10%	Current vehicle fare -15%	Current vehicle fare +5%	
TOTAL TRAVEL TIME	(Q10) min. + add'l wait time	(Q10) min.	(Q10) min. less (Q7A) + 3 min.	(Q10) min. less (Q7A) + 3 min.	
TOTAL TRAVEL COSTS	(Q11) response + add'l fare	Walk on fare + parking costs + Q11	(Q11) less off peak fare savings	(Q11) less off peak fare savings	



Questionnaire (cont.)

Scenario 11 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGIN SIDE TRAVEL	Drive my car to Ferry	Terminal parking @ \$8/day	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-land or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Terminal 2nd car park @ \$8	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	=Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response + two sailings	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare + 0%	Current passenger fare - 15%	Current vehicle fare - 20%	Current vehicle fare + 0%	
TOTAL TRAVEL TIME	(Q10) min. + add'l wait time	(Q10) min.	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + add'l fare	Walk on fare + parking costs + Q11	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Scenario 12 of 12	OPTION A	OPTION B	OPTION C	OPTION D	OPTION E
MAJOR TRAVEL OPTIONS	CURRENT DRIVE-ON	WALK-ON	DRIVE ON EARLIER	DRIVE ON LATER	DON'T TAKE FERRY
ORIGIN SIDE TRAVEL	Drive my car to Ferry	Park free & ride transit	Drive my car to Ferry	Drive my car to Ferry	Given these drive-on and walk-on options/fares, I would just not use the ferries and find some other way to accomplish my trip purpose (either on-land or combined with another trip or not at all).
ARRIVAL SIDE TRAVEL	Drive my car to destination	Shuttle to transit center	Drive my car to destination	Drive my car to destination	
FERRY DEPARTURE TIME	=Q3 response	Two sailings earlier than Q3 response	First off-peak sailing prior to Q2 peak period	First off-peak sailing after Q2 peak period	
FERRY WAIT TIME	=Q7A response	5 min	5 min	5 min	
FERRY FARE	Current vehicle fare + 5%	Current passenger fare - 20%	Current vehicle fare + 5%	Current vehicle fare - 5%	
TOTAL TRAVEL TIME	(Q10) min. + add'l wait time	(Q10) min. + Q6*0.25 + Q9	(Q10) min. less (Q7A) + 5 min.	(Q10) min. less (Q7A) + 5 min.	
TOTAL TRAVEL COSTS	(Q11) response + add'l fare	Walk on fare + \$3.00 + parking costs	(Q11) less off peak fare savings	(Q11) less off peak fare savings	

Thank you for completing this survey. We are very appreciative of the time you have taken to give us your honest opinions about the Washington State Ferry System.

Your opinion and those of your fellow riders will guide our decisions and hopefully will result in a better ferry system for everyone.